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THE

LECTURES

READ BEFORE THE

American Institute of Instruction.

AT

PLYMOUTH, N. H., JULY 11, 1876,

WITH THE

JOURNAL OF PROCEEDINGS.

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AMERICAN INSTITUTE OF INSTRUCTION.

FORTY-SEVENTH ANNUAL MEETING.

FIRST DAY'S PROCEEDINGS.

PLYMOUTH, N. H., JULY 11, 1876.

The exercises opened by a full and spirited meeting of the Directors, President LYON in the chair. The arrangements for the various meetings were completed, and the subject of the publication and distribution of the annual report of the Institute was discussed.

At 8 P.M., an audience, which filled Normal Hall, assembled to enjoy what was styled a Centennial meeting of the Institute. The great number of members in attendance, notwithstanding the intense heat, testified to the interest of the educators of New England in the work of the Institute, and the addresses of the evening were full of faith, hope, and courage. The President opened the exercises by an introductory speech, in which he congratulated the members upon their devotion to the cause of education, and to the interests of the American Institute of Instruction, which now celebrates its forty-seventh anniversary, and is the oldest educational body

in the country. Mr. Lyon referred to the ability and enthusiasm of the founders of the Institute, when, in 1830, many leading teachers, representatives of fifteen States, met at Boston to establish this association to advance the cause of learning. Among them were Francis Wayland (its first president), Gideon F. Thayer, Geo. B. Emerson, William Russell, William B. Fowle, Henry Barnard, and others of like stamp. Their labors were abundant, and their works follow them.

In the absence of General Eaton, Prof. S. S. GREENE, LL.D., of Brown University, Providence, was introduced as the first speaker of the evening. His first thought was thanks for a new century of educational labor, and from the first century, which is now completed, valuable lessons may be learned by educators. The experiences of the past are our best teachers, which serve to aid and elevate us. A noble work has been wrought in the last fifty years even, of which the country may be proud; and the Professor illustrated by a reference to the old-time methods of teaching and instruction, which had been superseded by the new. Many experiments have been made, and teachers should draw from all plans and methods the secrets of others' success, and will use them on their true merits, — "extract and adapt." The tendency oftentimes is to forget fundamental things. Our fathers had the profoundest reverence for the word of God. We must not let go the Bible. The schools must have religious principle. We must sit at the feet of the Great Teacher and learn His methods. Nicodemus said, "Thou art the teacher sent from God." Study his methods, and be inspired by Him.

Prof. Hiram ORCUTT, A.M., of West Lebanon, N. H., was then introduced. He said the thought of the hour

is our centennial growth as a nation, and when we ask its cause, we find it to be in our educational advantages. Thirteen colonies have grown to thirty-eight States and twelve territories; three millions of people have grown to forty. The country could never have survived an hundred years had it not been for our public schools. Our free schools saved the nation in the rebellion. The relations of the common schools, the high schools, and the colleges, were ably presented. The college is the source of the common schools, as the sun is the source of light, and the ocean is the source of the rivers.

T. W. VALENTINE, of Brooklyn, said that the State of New York had done something for education. In 1842 he went to Albany from New England to teach, and he gave an illustration of New York schools, past and present. He referred in commendatory terms to a bill before the New York Legislature to pension teachers at the close of their professional career, or to retire teachers on half-pay. The teacher is in public service, on small pay, and should be treated as other public officers.

Prof. CROSBY, of Nashua, N. H., was introduced as one of the "boys of the Institute." He wanted to talk on the inundation of text-books, but hadn't time. Where is the teacher who can keep alive, as a private school teacher? is asked. The speaker was one. He did not believe in pensioning teachers; better go to the poor-house. Are we worthy of our centennial privileges? If so, we shall be a noble people. The speaker remarked that if the Bible was taken out of our public schools, our liberties would be lost. Retain the Bible, if need be, by force.

W. A MOWRY, of Providence, R. I., classed himself

midway between the young and the old men. He spoke of the enterprise of the American people as the power which has advanced our public school interests. Methods not important; do your work well. Utilize methods; do not appropriate them as a whole. Our nation has made greater progress in its first century than any other nation has made in the same period.

Mr. GASTMAN, of Illinois, said that other speakers had spoken historically, but Illinois men could not celebrate her centennial. Illinois has a good history, and in giving Edwards and Bateman to education, and Abraham Lincoln to the presidency, she had done good service. In her institutions of the common schools, her normal schools, and her colleges, she has done a noble work. Illinois stands firm in her defence of all the positions she has taken on public education.

Prof. W. ATKINSON, of the Institute of Technology, Boston, said that a universal school system, grown in an hundred years, is a wonder, and on that principle we must stand or die. It will perpetuate our nation's life, and once abandoned, our nation falls. The augury of our success is in our system of popular school education. We have many battles yet to fight, but the way to assure success is to make education an obvious necessity, which all will recognize. Public schools will aid us in our battles. They put down a great rebellion; they will help us always. Education demands much, and we must be on the alert to keep up with the times. There is no quarrel between science and the classics, and there is no quarrel between science and religion. There can be no antagonism between them. The education of the future depends upon women. They are now in the majority in numbers, and they

must enter all of our schools, of all grades. Classes of women will take equal courses with men. Science and art invites them to enter their service. Progress is universal, — let us welcome it.

T. W. VALENTINE read the following, to be sent as a telegram to the National Teachers' Association, now in session at Baltimore:

"The American Institute of Instruction, the *oldest* educational organization in America, sends cordial greetings to the National Teachers' Association, the *largest;* may the cordial relations now existing between the two bodies, in this centennial year, be continued not only through the dawning century, but until time shall be no more, or ignorance be banished from the earth."

The exercises were varied, and enlivened by vocal and instrumental music by Mrs. MARTHA D. SHEPARD, of Plymouth, and by appropriate readings by L. W. RUSSELL, Esq., of Providence.

After business announcements by the President, Professor LADD, and the Secretary, the session was adjourned to meet at Normal Hall at 9 A.M., Wednesday.

SECOND DAY,—WEDNESDAY, A.M.

At 9 A.M. the Institute was opened with devotional exercises by Rev. H. SCOTT, of Plymouth, after which Prof. H. O. LADD, on behalf of the State Teachers' Association and the Normal School, welcomed the American Institute to New Hampshire in a very able and appropriate address. He spoke of the growing interest of the people of the State in the improvement of the public schools, and he expected a new impulse to come from the visit of the Institute.

C. A. BURLEIGH, Esq., in behalf of the citizens of Plymouth, welcomed the Institute in an earnest and cordial manner, as follows:

MR. BURLEIGH'S ADDRESS OF WELCOME.

Mr. President, Ladies and Gentlemen, — members of the American Institute of Instruction: It is my pleasure, and the wish of the citizens of Plymouth, to welcome to our public places and our family hearths all those composing your distinguished body, and to extend to them the simple hospitality of this country village. The advent of a society embodying so much scholarship and historic dignity, is an occasion of universal interest to us; and we are not unmindful of the honor you have conferred upon this village in making it the chosen place of your sittings, contrary to your hitherto unbroken custom of meeting at the great centres of intelligence and culture. We believe your sojourn here will convince you that mountain air is better than city tonics, and the warmth of country hearts a partial compensation for the lack of city refinement. You will not expect, in this mountain retreat, to enjoy the treasures of art, the laboratories of science, or the polished entertainments which more populous towns afford; but your exercises, being of a deliberative kind, may be as profitably attended amid the quiet of this rural town as in the busy whirl of more active industries; and if your recreations are not lightened by the attractions of the museum and the music of the opera, still may they be cheered by nature's songsters, and the rugged views of our grand old hills. Our attractions are the works of God more than the arts of man, and can now be seen in all their summer fullness; and

though the untutored savage may have given the name, Pemigewasset, it is our favorite stream: it rolls on through this magnificent valley in the same bed which the Great Architect hollowed out ages before the red man paddled his canoe upon its waters.

We could not, if we would, shut out the sublime view of the great stone hills in the north, whose loftiest peak in grand solitude proclaimed the power of God centuries before it was named for the Father of his Country. These gifts of nature, our mountains, lakes, rivers, and woodlands, have long been the pride and glory of our village, and the entertainment of visiting strangers. We call your attention to them that you may combine pleasure with the arduous duties of the occasion, and, in the absence of architectural splendor, discover the riches of our northern landscape.

Permit me again to greet you as the honored guests of the town, and to ask you to mingle with us in full freedom at our tables and firesides, and ere we are fairly acquainted, let us forget that we are strangers. While you share our hospitality, we also shall receive the great benefit of your literary efforts, and enjoy the companionship of our most prominent instructors. We earnestly hope that you will find as much pleasure in our society as we anticipate in yours, and that you can truthfully say, when leaving us, that your lines have fallen in pleasant places.

President LYON replied to the addresses of welcome, as follows:

RESPONSE OF THE PRESIDENT.

Gentlemen:—In behalf of the American Institute of Instruction, it gives me great pleasure to accept your

cordial welcome. You have already made us feel at home, and assured us that New Hampshire is a glorious State to come to, whether it be to go from or not. This is the sixth time we have visited your State, and have thus shown our readiness to accept your generous hospitality, and our desire to breathe the pure and invigorating air of your hills and mountains.

From your early history, it appears that Captain John Mason, one of the original patentees of your territory, and the owner of a large tract of land, a short time before his death in 1865, by will gave to his brother-in-law, "John Wallaston, in trust, one thousand acres for the maintainance of an honest, godly, and religious preacher of God's word; and one thousand more for the support of a grammar school; each of these estates to be conveyed to feoffees in trust, and their successors, paying annually one penny per acre to his heirs." New Hampshire has perpetuated the spirit of Mason, and ever united the two great civilizing forces, religion and education, whose external expression is the church and the school-house, and whose most prominent actors, the minister and the school master. Under these ideas her highest institution of learning, Dartmouth College, was founded, and has been nurtured, and she may well be proud of having sent forth from her halls Levi Woodbury, Daniel Webster, George Ticknor, Joel Parker, Rufus Choate, Isaac Fletcher Redfield, and Salmon P. Chase.

At our last meeting in Providence, the honored and successful Principal of Tilden Ladies' Seminary, and a prominent member of your State Board of Education, suggested that Plymouth would be a suitable place for our next meeting. In a few days he wrote me that the citizens of Plymouth cordially favored the suggestion,

and after stating the railroad facilities, hotel accommodations, and many other things important to the success of such a meeting, said that a Ladd in your village "was sure the people would provide for from seventy-five to one hundred ladies, and perhaps more." That was the lad for me, and I could hardly imagine what all the boys of the town would do, if one Ladd could give such an assurance. In the fullness of his heart he neither measured his words, nor guarded his expressions, but seemed to say, let all the girls come, and we will make them welcome. Time rolled on, and the next we heard of that Ladd, he was the dignified president of the New Hampshire State Teachers' Association, — "*quantum mutatus*"! — and in its behalf, he extended a cordial invitation to the American Institute of Instruction to hold its next meeting in New Hampshire. In response to this invitation we are happy to be here, prepared to engage in earnest work, and to manifest our love and honor for the profession of our choice.

Permit me again, gentlemen, to thank you and the teachers of New Hampshire, with the citizens of Plymouth, for your cordial welcome, and to invite you to take part in our discussions.

The PRESIDENT then delivered his annual address to the Institute:

ADDRESS TO THE INSTITUTE BY THE PRESIDENT.

Ladies and Gentlemen, — members of the American Institute of Instruction:—I am happy to welcome you to this glad anniversary of our association, which, for nearly half a century, has been foremost in every movement designed to improve the methods of teaching, school organization, and school supervision. It was

born of a desire to unite the leading educators of our country in improving popular education. Its contemplated sphere of action was as broad as the domain of our country: hence it was called the American Institute of Instruction. No narrower limits could realize the hopes of its founders. For many years its field of labor has almost exclusively been confined to New England, and its name is therefore a misnomer; yet let it remain, the proud memorial of its grand conception and comprehensive purpose. It is now in its matured strength, rich with golden fruitage, and has before it the hope of increased usefulness and honor.

In the briefest manner possible, I will endeavor to say a few words in regard to the difficulties, duties, and inspiration of the teacher's office. So far as they are directly connected with teaching and the school room, I shall only give them a passing notice, though to most persons these are the sum total of the teacher's responsibility.

It is scarcely necessary to say that, to be successful, the teacher must understand the nature of the child, and the law of the development of his faculties, mental, moral, and social. He must contend, often at great disadvantage, with stupidity, perverseness, love of pleasure, the seductive fascination of worthless and injurious books, aversion to diligent application to anything useful, and, most of all, opposition to faithful study.

Besides, he is often without the sympathy and earnest coöperation of parents and guardians. If he insists upon faithful work, and enforces prompt obedience, even in the mildest manner, he is likely to be told that he does not know how to manage children. The little fellow accustomed to say to his parents "I will" and "I wont," must be controlled by the magic word of his

teacher. I recently knew a youth who was habitually tardy, and when the teacher remonstrated with his parents, they regretted the fact, but said they could not get him up in season, and wished the teacher would require the boy to get up earlier.

Dr. Wayland once said, that during his long service as President of Brown University, he had been constantly told by parents that their sons were peculiar in their dispositions, and if he would succeed well with them he must regard those peculiarities. As he understood them, they simply wished their sons to do as they pleased, and if he did not object, he would have no trouble.

Another obstacle is met, in the disposition on the part of parents to place an incorrect educational value upon what are called studies of the memory, as compared with logic and mathematics; English studies and modern languages as compared with the ancient languages, especially Latin and Greek. The teacher's path lies always between these conflicting opinions, and he is fortunate who is so self-poised as not to run upon Scylla while attempting to shun Charybdis. It is to his advantage that, in his direct work, he is associated with those who are his inferiors in age and attainments, and to whom his word must be law. The unfavorable influence of this relation upon the teacher's character and manner is specially manifest in his early experience. The hero of many hard-fought fields takes a broader view, and sees in his pupils the future men and women who will critically review his work and pass judgment upon it.

Luther's teacher was accustomed to take off his hat and bow to his scholars when he came into his school, "because," said he, "there are some among my schol-

ars who will be magistrates and officers of the State.

I have more than once heard a distinguished President of one of our best New England colleges say he never thought of the miserable and almost worthless instruction of the teacher under whom he prepared for college, when he did not become exasperated. The manner of the utterance intensified the thought. Scholars have rights, and in due time they will be fully conscious of them.

The teacher should be responsive to every call of humanity. He should not be a party politician, but profoundly interested in the principles of good government; not sectarian, yet thoroughly religious, conscientiously inculcating Christian truth and moral obligation as the basis of all action; ever showing by precept and example, that while with him excellence in scholarship takes a high rank, a true Christian character holds the most exalted position.

In the performance of so many and delicate duties, failure to realize his ideal is the familiar experience of the teacher, and often overwhelms him with humiliating disappointment.

Channing says, "There is no office higher than that of a teacher of youth, for there is nothing on earth so precious as the mind, soul, character of the child. No office should be regarded with greater respect. The first minds in the community should be encouraged to assume it. Parents should do all but impoverish themselves to induce such to become the guardians and guides of their children. There should be no economy in education. Money should never be weighed against the soul of a child. It should be poured out like water for the child's intellectual and moral life."

On the island of Pharos, opposite to Alexandria, the

king of Egypt, in the early part of the third century before Christ, built a marble tower for a lighthouse four hundred feet in height, from whose top its light, a beacon to sailors, could be seen far out upon the sea, costing nearly a million of dollars, and considered one of the wonders of the world. The king directed the architect, Sostratus, a Greek, to build into its wall near the summit, a marble tablet, and to carve upon it a suitable inscription, with his name as the builder of the edifice, conspicuous. The architect, conscious that, so far as it expressed beauty, strength, and grandeur, it was the offspring of his own genius, secretly carved his own name, filled the letters with mortar, spread over the whole tablet an artificial covering made to imitate the natural color of the marble, and on this outer surface inscribed the name of the king, Ptolemy II., Philadelphus. For many years the name of the royal founder stood out in bold relief on the wonderful structure; but time gradually removed the inscription; the mortar, crumbling, fell; and then, carved in enduring marble, appeared the name of the architect, Sostratus. This illustration should encourage and stimulate those who instruct and guide the young, for what is superficial must pass away, but the truth well wrought into young lives will live forever.

At its close he gave a welcome to all to participate in the deliberations of the meetings, announced that business was in order. On motion he was instructed to report the usual committees of the Institute, at his leisure.

A paper was then read by HIRAM ORCUTT, Principal of the Tilden Seminary, on "Recitation."

In the discussion of this paper, Professor GREENE, of Brown University, commended especially the part which advocated the method of teaching children by *actually doing.* Children are not prepared for analytic and synthetic processes. Yet they may learn *to do* what they are not for the present prepared explicitely *to know.* Let them do their appropriate work, and they will soon know and understand what at first they can only do.

This principle applies with special emphasis to our methods of teaching children to read and write their mother-tongue. He submitted whether there is not a radical defect in teaching children the letters or any kind of conscious spelling, before teaching to write and read the language. Nature never permits the child to recognize *elements* or processes of continuation while learning to speak words, — notwithstanding the theorist insists that no word (*cat*, for example) can be uttered with producing and combining all elements which the word contains. The truth is, he does produce and combine, but unconsciously, — that the complete word may instantly stand for thought.

Now, in teaching the written language, we have nothing to do but to imitate nature. Let the child simply *make* the written words as the symbol of thoughts,— saying nothing, thinking nothing, caring nothing for letters, or processes of combining them. He merely imitates his teacher, as once he did his mother, and the result is he forms the word *cat* as the sign of his thought. And what he thus *forms* he ever after *knows* as the sign of thought,—not of mere *sound.*

It is not the *word-method*, technically so called ; for that teaches the child only to recognize the word as the sign of thought. This teaches him both to *make* and

to *recognize.* That fails to teach spelling; this teaches the spelling in the making, — the very best spelling he will ever learn; just that spelling which the best writers use, — that which *he* will use all his life-time. Yet it is an unconscious spelling. It rests upon the fundamental truth announced by the Great Teacher, and everywhere pervading nature, — "*do* in order *to know;* not wait *to know* in order *to do.*"

The discussion was further continued, in a spirited tone and with interest to the large audience of members and others, by F. W. PARKER, Esq., Superintendent of Schools, Quincy, Mass.; DAVID CROSBY, Esq., Nashua, N. H.; and Hon. J. W. SIMONDS, State Superintendent of Instruction of New Hampshire.

APPOINTMENT OF COMMITTEES.

President LYON announced the following committees:

On Nominations. — A. P. Stone, Massachusetts; Hiram Orcutt, New Hampshire; T. B. Stockwell, Rhode Island; Charles Northend, Connecticut; C. B. Hulbert, Vermont.

On Resolutions. — T. W. Bicknell, Massachusetts; J. W. Simonds, New Hampshire; E. Conant, Vermont; C. C. Rounds, Massachusetts; L. W. Russell, Rhode Island.

On Necrology. — E. Smith, Massachusetts; David Crosby, New Hampshire; A. J. Manchester, Rhode Island.

On Teachers' and Teachers' Places. — H. O. Ladd, New Hampshire; R. S. Andrews, Rhode Island; G. T. Littlefield, Massachusetts.

On New-England Journal of Education. — W. A. Mowry, Rhode Island; T. W. Valentine, New York; Solon H. Whitney, Massachusetts.

A recess of ten minutes was taken, after which a paper was read by Professor BURBANK, followed by an object-lesson. The following is an abstract:

OBJECT-TEACHING: ITS TRUE METHOD AND SCOPE.

In this paper object-lessons were treated of in two divisions; the first including methods in which objects are used merely as *symbols*, for the purpose of explaining or enforcing truths of an abstract nature; the second, embracing methods of direct study of the objects themselves.

It was further shown that objects may be studied directly; either with reference to certain special properties only, as in mathematics and physics; or for the purpose of acquiring an accurate knowledge of all their various properties, as in mineralogy, zoölogy, and botany. Hence it was argued that a complete and systematic application of the object-method is practicable in the natural sciences only.

It was further urged that some definite order or method should be adopted to the extent of the student's capacity and means of observation. Additional facts or illustrations may be directly given by the teacher, but great care should be used not to give, in this way, what the student may discover for himself in his future studies.

The method used in conducting object-lessons in mineralogy and geology, in the Teachers' School of Science of the Boston Society of Natural History, was then explained and illustrated by means of specimens and a set of the simple apparatus used.

The discussion was participated in by Professor GREENE, and others, who endorsed the views of the

speaker, with the exception of a less limited restriction of object-teaching as applied to physical science. Professor GREENE thought that the object-method might be as properly used in teaching other departments of study.

AFTERNOON SESSION.

The first paper of the afternoon was read by J. M. HALL, Esq., on "Geography in our Common Schools."

Mr. HALL's paper was discussed by Messrs. SIMONDS and RUSSELL, who endorsed its practical suggestions, and urged their adoption by teachers.

EDUCATION AT THE SOUTH,

Was discussed for half an hour by THOMAS W. BICKNELL, of Boston. He showed,—

1. That the old private and parochial system of the South was restrictive and proscriptive in its nature and influence, and that the Berkeleyan policy prevailed almost universally prior to the war, notwithstanding the free-school doctrines of Washington and Jefferson.

2. That the legitimate results of that system were the rebellion, and that the free-school idea was producing a great social revolution, more important than the emancipation of the negro.

3. That the free-school sentiment had had a most remarkable history and growth since the Rebellion.

4. That the dual system of separate white and colored schools was the only practicable one for the present in the South.

5. That the discouragements are,—

(1) The great poverty and heavy indebtedness of the South.

(2) The old elements of opposition to free schools as objects to be supported by universal taxation.

(3) The illiteracy of the people.

(4) The great want of good teachers, proper school-houses, and a healthy public sentiment in favor of general education.

6 That the encouragements are,—

(1) The rapid growth of a free-school sentiment.

(2) The support of the press and leading citizens.

(3) The favorable legislation in most of the Southern States.

(4) The excellent character of the schools which have been established since the war, both by public and private agencies ; and

(5) The grand benefits resulting from the wise use of the proceeds of the Peabody fund.

The speaker urged the merits of a bill now before the National Congress, for the distribution of the proceeds of the sales of the public lands among the States, at the outset, on the basis of the ratio of illiteracy, and claimed that such aid was absolutely needed by the people of the South to enable them to establish and support a permanent system of free schools.

ELBRIDGE SMITH, Esq., followed, arguing in favor of mixed schools at the South, and quoting the opinions of several Southern teachers in favor of the coëducation of the two races.

The last paper of the afternoon was read by Prof. J. C. GREENOUGH, A.M., Principal of the State Normal School, Rhode Island, on "English Literature."

The Institute then adjourned until the

EVENING SESSION,

When an able lecture was delivered by Rev. ASA D. SMITH, D.D., President of Dartmouth College, New Hampshire, on "The Moral Element in Education."

The day and evening were intensely hot, even in this mountain town; but the large audience witnessed to their zeal in the discussion of these solid problems of education.

At the close of the lecture, Prof. H. O. LADD, of the Normal School, illustrated his ability as a public reader in the recitation of several pieces, both grave and gay, and the village choir enlivened the exercises with agreeable selections of music.

At 10.00 o'clock p. m. the Institute adjourned its work till the morrow.

THURSDAY MORNING.

President LYON is a business man, as well as a scholar, and he believes that institutes and schools, as well as trains and steamboats, should be run on time. At 9.00 a. m. the Institute was opened; but the labors of the previous day, and the excessive heat of the morning, with the attractions of morning walks among the hills, produced sad cases of tardiness. Rev. J. ROBBINS, of Plymouth, read a portion of the Scriptures, and offered prayer.

President BUCKHAM'S address, which followed, was a discussion of "Moral Instruction and Discipline in the Study of the Classic Languages and Literatures."

Prof. H. O. LADD followed, with a paper on "Elements of Natural Science in our Public Schools."

ELECTION OF OFFICERS.

The Committee on Nominations then made their report, and the members of the Institute proceeded to ballot for officers for the ensuing year, with the following result of the election:

President—T. W. Bicknell, Boston.

Vice-Presidents—S. S. Greene, Providence, R. I.; Geo. B. Emerson, Boston, Mass.; Hiram Orcutt, West Lebanon, N. H.; Charles Northend, New Britain, Ct.; Sarah E. Doyle, Providence, R. I.; Calvin B. Hulbert, Middlebury, Vt.; C. C. Rounds, Farmington, Me.; A. P. Stone, Springfield, Mass.; Susan M. Hollowell, Wellesley, Mass.; John Eaton, Jr., Washington, D. C.; T. B. Stockwell, Providence, R. I.; Rebecca Jones, Worcester, Mass.; B. G. Northrop, New Haven, Ct.; T. W. Valentine, Brooklyn, N. Y.; Ellen Haskell, Norton, Mass.; Daniel Leach, Providence, R. I.; David N. Camp, New Britain, Ct.; Fannie A. Turner, Melrose, Mass.; John D. Philbrick, Boston, Mass.; Henry E. Sawyer, Middletown, Ct.; Fannie E. Kyle, Essex Junction, Vt.; D. B. Hagar, Salem, Mass.; Joseph White, Williamstown, Mass.; Emma Taylor, East Derry, N. H.; Charles Hammond, Monson, Mass.; John W. Dickinson, Westfield, Mass.; Mary E Rowe, Laconia, N. H.; Albert Harkness, Providence, R. I.; David Crosby, Nashua, N. H.; I. N. Carleton, New Britain, Ct.; George T. Littlefield, Boston, Mass.; Elbridge Smith, Boston, Mass.; F. F. Barrows, Hartford, Ct.; A. G. Boyden, Bridgewater, Mass.; C. O. Thompson, Worcester, Mass.; E. A. Hubbard, Springfield, Mass.; H. O. Ladd, Plymouth, N. H.; W. E. Eaton, Boston, Mass.; M. C. Stebbins, Springfield, Mass; J. W. Simonds, Franklin, N. H.; George J. Cummings, Meri-

den, N. H.; L. W. Russell, Providence, R. I.; D. W. Hoyt, Providence, R. I.; Edward Conant, Randolph, Vt.

Secretary—J. Milton Hall, Providence, R. I.

Asst. Secretary—Geo. A. Littlefield, Malden, Mass.

Treasurer—George A. Walton, Westfield, Mass.

Councillors—Merrick Lyon, Providence, R. I.; M. G. Daniell, Boston, Mass.; W. A. Mowry, Providence, R. I.; J. G. Dearborn, Manchester, N. H.; A. J. Phipps, Medford, Mass.; C. P. Rugg, New Bedford, Mass.; A. J. Manchester, Providence, R. I.; Horace M. Willard, Newton, Mass.; A. P. Marble, Worcester, Mass.; B. F. Tweed, Boston, Mass.; J. C. Greenough, Providence, R. I.; Augustus D. Small, Salem, Mass.; James S. Barrell, Cambridge, Mass.

After the election of officers, the Institute adjourned, to meet on board the steamer "Lady of the Lake," on Lake Winnepesaukee, for an excursion from Weirs, across the Lake to Wolfboro' and return.

THE EXCURSION.

At 1 P.M. a special train, furnished by the courtesy of J. A. Dodge, Esq., superintendent, and the directors of the Boston, Concord, and Montreal Railroad, took a company of over four hundred persons, members of the Institute and their friends, to Weirs; and on their arrival the commodious lake steamer took on board the same company, — happier, braver, wiser, hotter, and jollier than she had ever before borne over the "Beautiful Lake of the Highlands." The islands, covered with their growth of the children of "forests primeval," their shadows bathed in the emerald waters along the shores, the surface of the lake flecked with ripples, the

dancing sunbeams (?), the ever-changing panorama of moving islands, mountains, and waters, the everlasting hills, within whose embrace the lake is held as a jewel in a coronet, — Belknap, the Sandwich Range, Ossipee, White Face, Red Hill, Prospect Hill, Kearsarge, Copple Crown, and, king over all forever, the distant peak of Mt. Washington, the clouds capping one and another peak,—the picturesque village of Wolfboro':— all these, and numberless other objects of interest, occupied the attention of the delighted company. Conversation, grave and gay, witty and severe, songs and varied merriment, filled the attention of the teachers; and their pupils would never have guessed that these were the staid and dignified men, matrons, and maids, who only a short week ago were sustaining, with excellent manly and womanly grace, the honors of the school rooms.

The compensations of human trials and infirmities are found in the graces of patience, cheerfulness, and repose; and in the midst of upspringing wishes and desires to be anywhere, in any quarter of the globe save on board the "Lady of the Lake," in that broiling heat, there was everywhere the expression of peace and satisfaction, which said how glad we are that we have come.

But all good things have a beginning and an end, and happy are they who, as in this sail, are happiest in their conclusion. Oh, the sweetness, the coolness of that westerly breeze, as we turned our faces toward Weirs, and our backs on Wolfboro'! The Pavilion had its attractions, but one saw better things reflected on the western sky over old Plymouth, and the journey was retraced with glad hearts, which had seen how lavish Nature has been in her displays of beauty, grandeur, and glory, in and about the waters, which are but a reflex of the smile of the Great Spirit.

THE EVENING SESSION.

at 8.00 p. m. closed the work of the Institute. Professor THOMPSON had the post of honor of the evening, and in his able and carefully-wrought paper, he discussed most clearly and satisfactorily, "The Place of the Polytechnic School in American Education."

THE RESOLUTIONS.

At its close the Committee on Resolutions, through Chairman Bicknell, reported the following, which were seconded *en masse:*

Resolved, That the hearty thanks of the members of the American Institute of Instruction are extended to Hiram Orcutt, A. M., L. S. Burbank, A. M., J. M. Hall, Esq., Thomas W. Bicknell, President Asa D. Smith, J. C. Greenough, A. M., H. O. Ladd, A. M., President H. B. Buckham, and Prof. C. O. Thompson, for valuable educational papers and addresses; to L. W. Russell, Esq., and H. O. Ladd, A. M., for interesting and instructive readings; to Mrs. M. D. Shepard, and the "Select Choir" of Plymouth, for entertaining vocal and instrumental music; and to all others who have added to the interest of the literary exercises of these meetings; to the proprietors of the Pemigewassett House, the Plymouth House, and the White Mountain hotels, for a generous reduction of hotel fares; to the Providence and Worcester; Worcester and Nashua; Boston and Providence; Old Colony; Boston, Concord and Montreal; Boston, Lowell and Nashua; Fitchburg; Boston, Clinton and Fitchburg; Connecticut and Passumpsic Rivers and Massawippi Valley, Central Vermont, and Connecticut River Railroads; to the lines to White

Mountains and Mount Washington, stage lines to or from Franconia Notch, Littleton, Bethlehem, Twin Mountain House, Crawfords, and Fabyan House, for reduced fares over their respective routes; to the trustees of the New Hampshire Normal School, for the free use of the Normal School buildings for our meetings; to the young ladies and gentlemen of Plymouth, for the neat and tasteful decorations of Normal Hall; to the citizens of Plymouth, who have opened their homes and hearts, with courteous and cordial hospitality, to entertain so large a gathering of lady members of the American Institute. To H. O. Ladd, Esq., the able, efficient, and successful principal of the State Normal School, the deepest thanks of the Institute are due, and are hereby tendered, for his earnest and unwearied labors to promote the success of the Institute, and the personal and social enjoyment of the members. To J. A. Dodge, Esq, the energetic and gentlemanly superintendent of the B. C. and M. R. R, the special thanks of the Institute are due, and tendered, for his valuable and untiring personal efforts to extend the facilities of travel to the members, both by rail and stage, to and from Plymouth, and among the mountains of New Hampshire, and also for the facilities of a most delightful free excursion by rail to and by the "Lady of the Lake," over Lake Winnepesaukee. His efforts for our comfort and happiness awaken our truest gratitude.

Resolved, That the National Bureau of Education at Washington is a source of great benefit to the educators of New England and the country at large, and that we claim for its support and proper maintenance, the influence and votes of all the true friends of educational progress in our national Congress, and that we shall deplore any efforts which may be made tending to weaken its power, or to restrict its influence for good.

Whereas, The American Institute of Instruction believes in extending to all portions of our land equal equal educational facilities, and that in the impoverished condition of the Southern States we see the need of something more than local support to enable that portion of our republic to enjoy free-school privileges in an equal degree with the Northern States, therefore,

Resolved, That we endorse the plan to appropriate the proceeds of the sale of the public lands for educational purposes, to be disbursed at the outset on the ratio of illiteracy among the several States of the Union.

Resolved, That the American Institute of Instruction, in this Centennial year of the nation, re-affirms the principles of its founders, in favor of universal, unsectarian education for the people; of a State system of public education supported by general taxation; of laws protecting the children in the enjoyment of school privileges; of a system of education which recognizes the unity of the several grades of instruction, reaching from the primary school through the college; of the unity also of public and private institutions, as constituent parts of one whole; of the establishment of normal schools, as the true foundation of a true professional training; of the establishment of schools of science, art, and industry, to supplement the common school and give greater efficiency to it; and finally, to the great importance of the recognition of the moral element in education as the foundation of all sound learning, of good society, and of a truly Christian Republic.

Resolved, That the thanks of the American Institute of Instruction are due to Merrick Lyon, LL.D., our retiring President, and J. W. Webster, Esq., our retiring Secretary, for the uniform courtesy with which all who have participated in our meetings have been treated by

them ; for their great tact, and remarkable energy and efficiency in conducting the business of the Institute ; and for their successful inauguration of the progressive steps which have been made by the Institute, in the work of education, during their administration.

The several resolutions on being read, were seconded by gentlemen who spoke upon their merits.

Messrs. Stone, Mowry, Lyon, and Webster, did the honor to Superintendent Dodge, — whom not having seen, they admired and praised ; then, most deservedly came Professor Ladd, for a good share of well-earned, complimentary words from Lyon, Mowry, Northend, and others. Messrs. Northend and Russell and Lyon declared that if there was a heaven on earth, it was the village of Plymouth, and its citizens must therefore be the angelic inhabitants. So all concluded, both before and after the speeches ; the hour was full of thanksgivings, and a *rising vote* testified that *heart* and *muscle* joined in the offering. The retiring President Lyon, who has served the Institute with a diligence and singleness of heart peculiar to that veteran educator, made his valedictory bow with a short and sensible speech, and invited Messrs. Stone and Orcutt to conduct the incoming President to the chair which he vacated, and to receive the mantle which he put off.

President BICKNELL thanked the Institute for the honor conferred, and invited the members to join in singing "America." It was done with a royal good heart and will, and then was raised the thank-offering in "Praise God from whom all blessings flow." Each breathed his benediction on all the rest, and the Institute adjourned *sine die.*

LECTURE I.

Recitation.

BY HIRAM ORCUTT, A.M.,
WEST LEBANON, N. H.

The results of a practical education are illustrated not by the golden cup filled to the brim, but by the swelling buds developed into blossoms and ripe fruit, through the genial influence of light, heat, and moisture.

Education is not, therefore, the storing of knowledge, but the development of power, through exercise. And study and recitation are the chief agencies to be employed in this process of training.

The relative importance of recitation, as a disciplinary agency, is seen in its practical bearing in every department of life.

The child learns to walk by walking, and to talk by talking, and these acts are the expression of his strength, which is increased by repeated exercise, until it becomes a practical power. The mechanic learns to use his tools only by using them. He could never acquire the ability to build a house, construct an engine, or make a watch, by reading books or hearing lectures upon the subject. He must recite, again and again, what he has learned from his master before he can become an efficient and skillful workman. The musician

gains his wonderful ability to use the voice and the instrument by years of patient recitation. The orator whose eloquence moves the Senate, and attracts the attention of an admiring nation, has gained his power by the practice of oratory. And the art of easy and graceful conversation, and elegant composition, is acquired only by conversing and composing. Indeed, the whole process of physical, intellectual, and moral culture, depends upon the same principle.

It is the *exercise* of the muscle or faculty to be developed, — "the repetition of something learned," as the means of acquiring ability and skill in the use of that muscle or faculty.

Thus the gymnast, by constant and systematic drill, not only develops a symmetry and beauty of form, but agility and precision of movement that is wonderful. And the art of systematic thinking is acquired by thinking. Indeed, every faculty of mind as well as of body is developed, and all practical ability gained by *exercise.*

And it is the *practice*, and not the theory or knowledge of virtue, that moulds and matures the good man's character.

Recitation in the schoolroom has some incidental advantages of its own. Thus, properly conducted, it induces study. If no recitations were required in the school, or if it was understood beforehand, that the teacher would occupy the hour in lecturing or asking questions, comparatively few lessons would be learned.

Recitation also serves to give distinctness and vividness to acquired knowledge ; to fix it in the memory, and to render it available for future use. As every practical teacher knows, no lesson is completely learned until it has been recited. By this means, what was crude and half-formed is made sound and ripe ; what

was seen in the distance is brought near, and what was doubtful is made certain. And thus the intellect is furnished and strengthened for the service of practical life.

Again, recitation has an important relation to instruction. The former, like study, is exclusively the work of the scholar; the latter belongs to the teacher. Study is the act of acquiring; the exercise of the mind in search of knowledge. Recitation is the act or art of expression. And it is the province of instruction not only to impart information, but to awaken enthusiasm, inspire thought, and induce and direct study.

But school instruction fails of its object if it does not aid the pupil in self-application; and recitation is of little avail, as I have intimated, unless it serves to render acquired knowledge more definite and available, and to cultivate the habit of correct expression. And the teacher should never forget that *discipline* is the primary object of study, instruction, and recitation.

Methods of conducting recitation next claim our attention.

And first, the teacher has to deal with children, and he may safely go to childhood's home for instruction upon this subject. In this school of nature, the child, unrestrained by school laws, and without a master, is constantly learning and reciting in the most effectual manner. His lessons are the objects, — the toys, the animals, and the things by which he is surrounded. These engross his attention, and awaken his interest. His mind is alive to everything his eyes behold, and he recites with earnestness the thoughts and impressions which his own investigations reveal.

Next to the living, tangible object, the picture attracts his attention. He hails with joy the monthly visits of the *Nursery* and *St. Nicholas* to his home, and

takes possession of every picture-book that comes in his way.

But the child never deals with abstractions, nor troubles himself about the unmeaning elements of which the objects around him are composed. He cares nothing for the etymology of the name, or the sounds which combine to give it expression. He knows the object by sight, and speaks the name without hesitation. Its uses and utility are soon matters of inquiry, and all his acquired knowledge is rehearsed with enthusiasm to his mother, sister, brother, or playmate, and if these fail to give him attention, he seeks the audience of the inanimate, personified things around him, and to them rehearses his childish story.

Thus the unlettered child in the nursery and playhouse teaches us how many blunders have been made and how much harm has been done, by false methods of conducting primary recitations at school. If the child's interest and enthusiasm are to be preserved; if his school is to be made a source of pleasure, and not of pain; if his education is to be prosecuted in the natural and most effective way, his school must be modeled after the home. He must still enjoy much freedom; must not be confined to the schoolroom during long and dreary hours, with nothing to do.

The child's recitations in school should embrace original accounts of his out-of-door sports and adventures, and when not otherwise occupied, he should be allowed to recite by drawing and writing upon the slate or blackboard. If at school at all, in childhood's days, he should be treated as a child, and allowed to study and recite as a child.

And even when introduced to books, the child's recitation should be conducted with the nursery and play-

house full in view, — the thing before the sign, — words before the alphabet, — facts first, analysis afterwards; and the meaning always understood.

Therefore, the primary reading lesson should be a recital of *words* recognized at sight, and fully illustrated by objects and pictures. The child should thus read page after page of such books as are adapted to his age, until he can read readily and accurately. And as far as practicable, he should be taught to write or print these words upon paper or slate, and to define their meaning.

Another feature of a well conducted recitation for children, is a rehearsal of the story or item of history which the class has just read. In my own experience with this method, I have found that spelling is taken up by the child as a matter of curiosity and interest, and learned with much more accuracy and rapidity than in the old way. Punctuation and the use of capitals become a part of each recitation, and the pupil progresses understandingly and with increasing interest from stage to stage in the process of his education. And by reciting the thoughts of others found in books, under proper instruction, he not only acquires the power of accurate expression, but also the power of thought. He thus learns to think for himself, and to express his thoughts in his own language. And, I repeat it, the ability to think accurately, compose readily, and speak gracefully, can be acquired only by recitation.

In speaking more definitely of the usual methods of conducting recitation, it should not be forgotten that discipline is the end in view, and that recitation, as a means of securing practical results, is as important as study. It must follow, therefore, that each pupil in every class, must recite at every recitation, if he is to

receive the full benefit of the school. I am aware that this conclusion is not universally accepted. I recently heard an experienced educator assert, that with a skillful teacher, a class of seventy-five can be as thoroughly drilled as a class of ten. And I have observed that the practice of instructing large classes still prevails, to some extent, in the public school, academy, and college. I admit that, in some cases, the evil cannot be avoided; but it is, nevertheless, an evil, and if adopted as a rule and approved, it must be regarded as professional *quackery*. I earnestly insist that any arrangement of classes which renders a daily, personal drill impossible, is a fruitful source of indolence and superficial scholarship, and that it results in an irreparable loss to the scholar.

Nor can the Socratic method of conducting recitation be commended as the most desirable.

The teacher's questioning is not the scholar's reciting, nor can answering questions alone serve the purpose to be gained. Questioning, therefore, should never take the place of recitation. It may be useful as a means of directing the scholar to special thoughts, or topics, which have been omitted in the recitation; and in examinations and reviews, to ascertain his standing. But when questioning is practised in connection with recitation, it should be done with great care. No leading questions are allowable either in the court, or in the schoolroom. Questions that suggest or imply the answer, furnish a strong motive to indolence, and result only in evil. And whether question or topic, it should be put to the class, before calling up the individual who is to answer or recite. This method serves to fix and hold the attention of all, and to give each the full benefit of the class drill.

And while special regard should be had by the teacher, to the matter, form, and mode of the question, special attention should also be given to the matter, form, and mode of the answer. It should be confined to the question; should be accurate and logical, and should be given in correct and appropriate language.

Here rigid criticism is requisite, to correct that vague and loose method of study and expression, which often results in mental confusion and anarchy.

Written recitations have greatly the advantage over verbal, as they bring the scholar at once under criticism in several departments of primary instruction, — such as penmanship, orthography, use of capitals, punctuation, and style of composition.

Again, I would protest against lecturing as a substitute for recitation. The teacher's talking is not the scholar's reciting. The school-room is not the place to test the loquacity of the teacher, but rather the fidelity of the scholar. It should be sacred to class-drill.

Lecturing, however, like reading and traveling, is a legitimate method of imparting instruction, and whenever it is practiced before the school, the opportunity should be improved to cultivate in the scholar the habit of *listening*. I apprehend that this important habit is too much neglected in our schools, as seen in the inattention and heedlessness of the public assembly. They hear, but do not understand, and often retire from the church or lecture-room with little or no knowledge of the subject discussed.

To obviate this difficulty, let the teacher, whenever he gives a public lecture before the school, require the class to *listen*, and afterwards to *recite* the subject-matter of the discourse. In this way they will soon gain

power to follow a speaker with interest and profit; will no longer be listless hearers.

But if we would secure to our pupils all the benefits resulting from well-conducted recitations, we should employ questioning and lecturing only incidentally, and should adopt and practice the *independent topical recitation*. That must be the true method which throws the pupil upon his own resources, compels him to study, and enables him to acquire the power of accurate expression. Any method of instruction which weakens the motive, or removes the necessity of laborious thinking, and self-relying recitation, is false in theory and ruinous in practice.

Hence the "drawing-out" and "pouring-in" systems cannot be tolerated, except for the purposes I have mentioned. If thinking and reciting are the only means of gaining mental power, as I have maintained, to deprive the scholar of daily recitations is to rob him of his "inalienable right." It is not enough that the lesson has been learned,—it must be *recited*, under criticism, to become available. And as the recitation is wholly the work of the scholar, he should recite topically, as far as possible.

Captions, definitions, tables, and fixed rules, should be recited in the words of the author; but the ordinary lesson, in every department of study, should be recited in the scholar's own language. The memory should be the depository of *thoughts*, and not of mere words and symbols. And as one object of recitation is to acquire an accurate and free use of language, it is the special duty of the teacher, in conducting recitations, to insist upon accuracy and felicity of expression, and to require repetition until the oral sentence has been properly constructed and expressed.

And that the scholar may acquire the habit of thinking and speaking while on his feet, and gain confidence and self-control, he should be required to stand while reciting; he should neither know, nor have the ability to calculate, what part of the lesson will be assigned to him, but should be left to feel the necessity of mastering the whole subject thoroughly.

Some thoughts cannot be expressed in words. They must be drawn out in figures, diagrams, and maps. Whole chapters of history may be written in a finely executed picture; and sometimes even words are better expressed in silence than by sounds. All these are methods of recitation, and each has its own place and utility.

Again, in conducting recitations, the skillful teacher will deal with his pupils according to their different capacity, attainments, and dispositions. Each class and individual require special treatment. Each mind must be tasked to be educated, and this is as necessary for the easy as for the dull scholar. The practical power to be gained by each does not depend so much upon talent as upon discipline. Hence, of the easy scholar much more should be required; for him much less should be done by the teacher, if both are to be equally benefited. If he acquires readily and recites fluently, assign him other lessons, according to his capacity, and require of him a more perfect recitation. Even the most brilliant talents are developed only by culture.

If the scholar lacks interest and application, he should be stimulated and pressed; if he lacks confidence, he should be encouraged; if he stumbles and falls, he should be aided to rise again; if he is idle and self-sufficient, he should be put under *severe* pressure in

the class-room, and held in the recitation until his ignorance is exposed, and he is made to feel the necessity of personal application. Recitation is the test of all these peculiarities, and if adapted to the different capacities and circumstances of the individual scholar, it will prove the means of securing the desired object.

In this process of class-drill, the teacher should ever bear in mind that he has to cultivate in each scholar the habit of self-reliance and independent thought and action; and to this end he must adopt the golden rule in education, never to render assistance unless needed to save the scholar from discouragement; and never to remove a difficulty which the scholar has the power to overcome.

Still one more suggestion; the recitation, to be profitable, must be made attractive and interesting. Here is the grand test of the teacher's ability. The secret of his success is found in his power to inspire his pupils with earnestness and enthusiasm. To *make up mind*, is his first and most important duty. If he has *this* ability, he is at once master of the situation, and his success is assured.

But this special power (if allowed the diversion) is *inborn*. I doubt if it was ever acquired. As I have elsewhere expressed the thought, the teacher who has this magnetic power is alive and in earnest; his heart throbs with tenderness and emotion; his blood flows *freely* through his veins, and imparts freshness and vigor to his whole being. Enthusiasm speaks out in his voice, glows in his countenance, flashes from his eye, streams from his fingers, and infuses itself, like leaven, through the whole school.

In closing, I desire to congratulate my fellow-teachers upon the honor which crowns our profession. "To

teach," said Channing, "whether by word or action, is the greatest function on earth." This assertion applies to Socrates, as well as to Arnold or to Horace Mann. But *we* occupy a more reponsible position than either of these distinguished men. We are not only permitted to teach in the American republic, but to live and act amid the stirring scenes which distinguish the opening of the second century of our nation's independence. Let us realize the dignity of our position, and the weight of our responsibility.

LECTURE II.

Geography in our Common Schools.

BY J. MILTON HALL,
PROVIDENCE, R. I.

Geography is a science, and, like most sciences, is either practically illimitable, or is so closely connected with several others, that it is very difficult to point out the exact line of demarcation. In the little time assigned to this subject, we can touch but briefly upon a few of the many important and interesting portions of this great theme. Our considerations must, to a great extent, be governed by the fact that in the small portion of time which the average pupil is at school, but a comparatively small part even of that time can be given to this subject.

Only those portions, then, should be made prominent which, thoroughly mastered, will give the pupil a fair knowledge of the great planet on which he lives, and at the same time leave him so well grounded in the science, that should it be his desire to pursue a more extended course, he will not be compelled to 'unlearn' anything.

Geography, like other sciences, has its own terminology. What real permanent progress would one make in geometry without an accurate apprehension of the

terms point, line, angle, surface, and solid; or in chemistry, without a clear conception of the meaning of the words gas, liquid, solid, base, acid, and alkali? In like manner, the beginner in geography should first master the nomenclature, so far as is possible. I say so far as is possible; for to what one of us, at the age of ten or twelve, did the word 'continent,' for example, convey all the meaning which it now does? Hence the definitions, and a clear, although not necessarily a full appreciation of the form of the earth, the natural divisions of land and water, the important points of the compass, etc., must be fixed in the mind before we can look for any real progress. Familiarity with the points of the compass, and the ability to point in the direction of that portion of the earth which is under consideration, should be insisted upon. In those schoolrooms where the pupils sit facing the north we find little difficulty in this matter, on account of the correspondence between the representations on their maps and the actual points.

In these days, when steam and electricity have brought us into such close connection with all parts of the habitable world, when children's newspapers and children's books of travel are to be found in almost every household, the average American pupil, before he attains the age at which he begins this study systematically, has, to a great extent, become familiar with the expression "around the world," and also with the names of many important cities, States, and nations; and in these days of travel, and especially of summer excursions, there is little need of elaborate descriptions of mountains, islands, capes, bays, lakes, rivers, and the ocean, since all are comparatively familiar objects to even quite young children.

We cannot well take up either of the three departments of geography, mathematical, physical, or political, without, at the same time, making use of the others. Hence, to a certain extent, these three departments must be carried along together, but not made equally prominent. For my own part, I would do but little with mathematical geography, until the political, and quite a large portion of the physical geography were very well advanced.

I trust that you will pardon me if I recall to your minds two principal methods of beginning instruction in this science. The first, which I will call the *analytic* method, begins with the earth as a whole, — its form, motions, and relation to other heavenly bodies; its circles, zones, and subdivisions, natural and arbitrary, and finally brings the pupil down to his own immediate vicinity. The second, which I will call the *synthetic* method, is the reverse of the first, and begins with a plan of the school yard, the location of adjoining premises, the direction of well-known streets, and boundary of the town; after which follow the county, State, and adjoining States, until

"Earth's remotest bound"

is, perhaps, finally reached.

One of the objections very strongly urged against the former method is, that the beginner has not the mental ability to comprehend so vast a subject, while it compels him to struggle with mathematical geography before his mathematical studies have prepared him for the work. On the other hand, it is claimed with equal pertinacity that the pupil who follows the synthetic method wastes much valuable time on comparatively unimportant minutiæ. Each of these methods has its excellences, — for there is always a grain of truth in

radicalism, — each its defects; both have very earnest defenders. And may not the fact that each has such earnest advocates be taken as pretty conclusive evidence that there is a middle course, combining both, which is far better than either?

What should be taught in regard to each political division? In reply, I would say just those geographical facts which the pupil's memory can retain, and which are of the most importance for a well-informed citizen to know. Hence, great care must be exercised in deciding how many and what facts shall be mastered. Suppose that Blank's *Common School Geography* states four thousand geographical facts, and that one-half that number is all the average pupil can retain in his mind. The "Course of Study" says very definitely Blank's *Common School Geography, finished.*" What is to be done? The conscientious young teacher feels that the author ought to know better than he what should be taught, and hence, frequently follows the course laid down in the text-book, unmindful of the fact that the compiler of that text-book did not issue a work especially adapted to the needs of the schools of one State to the exclusion of the others, but it was his aim to prepare a work which might be used with equal advantage all over our country. Hence, he must be as explicit in his treatment of Illinois as of New Hampshire; but it by no means follows that New Hampshire pupils are to give equally full descriptions of these two States; and the same is true of the Illinois pupils.

It is not reasonable to suppose that any school text-book on this subject will contain all that our pupils should learn in regard to their own States, while nearly every one contains much in regard to distant localities which is comparatively unimportant. *A vast amount of*

time may be wasted in burdening the mind with unimportant details.

Should any of us be transported to some hitherto unknown country, and so located that the whole of that country were brought within the range of our vision, the most natural question would be, What is this region, and where are we? This, in substance, is the first question which I would present for the pupil's consideration, that the general subject may be brought before the mind previously to any extended description. *What, and where is it?* This would be my first question, or topic. What other lands, what waters, surround this strange, new country? Hence, I would make the "*Boundary*" my second topic. And here much valuable time is often wasted. I have known pupils to be marked for failure, and compelled to remain after school hours and make up the entire lesson, because, in giving the surroundings of Arkansas, the State of Missouri was omitted from the western border. Happily, this practice of taking undue notice of every slight variation of the boundary line, every little 'panhandle,' is fast dying out.

But to return to our new country. The most prominent objects in our field of vision are the mountains, if there be any. Let "*Mountains*," then, be our third topic. Through what part of the country, along what borders, and in what general direction do they extend? Are there any important peaks? Do not be too prodigal of these. Outside your own State a dozen are enough, and one-half that number will answer very well. It is desirable to know the name and location of the highest peak in most of the grand divisions, and also to know something concerning the most noted volcanoes.

From and between these mountain ranges flow the

rivers. Hence, I would next turn the attention to the rivers. Where do they take their rise? In what direction, and through or between what divisions do they flow? What other bodies of water do they finally reach? In connection with the rivers, the slope and general surface of the land may be taken whenever thought desirable, thus making use of the knowledge already obtained in regard to mountain ranges. These "*Other Bodies of Water*," — *salt or fresh*, — claim our next attention. In these bodies of water are the "*Islands and Capes*," the most important of which we will name and locate.

We have now noticed nearly all the physical geography of the country that the mass of our pupils can profitably consider. Along the shores of these bodies of water, on the banks of these rivers, and in the midst of the widely-extended plains, we can see the great centres of trade and industry. Hence, we will take as our seventh topic, the "*Capital and other important places*." The learner must be guided in the selection of these mountains, rivers, islands, capes, and towns; otherwise much valuable time will be wasted in learning something about an insignificant town, which ought to be given to gaining a knowledge of some important and growing city.

Lastly, we may ask, For what is this country noted? What are its productions? its manufactures? its commerce? Has it any other sources of wealth? How do the inhabitants get their living? Are there any natural curiosities worthy of mention? What additional items of interest can be given in regard to the history, customs, manners, morals, religion, etc.? In the consideration of this eighth topic, "*For what noted?*" I would allow the widest latitude, and encour-

age the pupils to obtain all the information that they can, and from any authority to which they may have access, either in school or at home; and the class, not to say the teacher, will often receive valuable informa-

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NOTE.—In order to show the manner of reciting, I have placed below the work of a child of ten or eleven years. The blackboard work is first done from memory, under the eye of the teacher, and is arranged somewhat as follows:

1. . . . . 6. . . . . .
2. . . . . 7. Hartford,*
3. Green, New Haven,
4. Connecticut, Bridgeport,
Housatonic, New London,
Thames. Stonington.
5. L. I. Sound. 8. . . . . .

With pointer in hand, the child commences somewhat as follows: "Connecticut is one of the United States, and is also the most southwesterly of the New England States. It has Massachusetts upon the north, and Rhode Island on the east; on the south lies Long Island Sound, and the State of New York lies upon the west. Its mountains are a portion of the Green Mountains, which extend north and south through the northwestern part of the State. Its most important rivers are the Connecticut, Housatonic, and Thames. The Connecticut river starts from Connecticut Lake, in the northern part of New Hampshire, and flows in a southerly direction, with New Hampshire upon the east and Vermont upon the west, and then across Massachusetts and Connecticut into Long Island Sound. [Describe the other rivers.] The only other important body of water is Long Island Sound, which lies south of Connecticut. There are no important islands nor capes. Long Island, which lies south of Long Island Sound, belongs to the State of New York. The capital is Hartford, which is situated on the right bank of the Connecticut river, a little north of the central part of the State. Some of the other important towns are New Haven, Bridgeport, New London, and Stonington. [Now locate each.] Connecticut is noted for its manufactures of clocks, silver, brass, iron and wooden ware, hats, combs, brushes, buttons, cutlery, etc.," — there being no definite limit to the amount given under this topic.

tion as the result of the researches of some enterprising pupil. Here the climate can be enlarged upon. Why is this region noted for its grains, while another must import the greater part of its food? What induces people to live in the latter etc.? Our topics, then, would be,—

1. What, and where is it?
2. What surrounds it?
3. Mountains.
4. Rivers.
5. Other bodies of water.
6. Islands and Capes.
7. Capital and other important places.
8. For what is it noted?

Let us look for a moment at some of the advantages of this method of recitation.

1. The pupil knows how to study his lesson without waste of time.

2. A habit of arranging work systematically is inculcated.

3. A connected description is given.

4. Power of expression is cultivated.

5. A written abstract of the lesson can be given which shall not be a confused jumble; and such written abstracts should be frequently required.

6. It makes the pupil familiar with the spelling of geographical names, by compelling him to write all that he uses.

By calling rapidly upon different members of the class, all may participate in the recitation; and much of the time which is often spent in asking questions may be saved for the map-drawing exercise, which should be the inseparable accompaniment of recitations upon the political divisions.

In this connection, permit me to say a few words in regard to the maps which accompany these recitations. I refer now to the every-day, "working-drawings," if you choose to call them such. I am fully satisfied that it is best to allow no mountains, rivers, nor lakes, to be represented which are not to be described. There is always a very strong temptation on the part of pupils to add a few branches to the rivers in order to relieve the vacant appearance of certain portions of their maps. This may occasionally be permitted in the execution of finely-drawn maps, but they consume too much time for every-day work; and, — are they *true* representations?

I have seen maps of New England placed upon the blackboard *from memory*, whose execution required less than six minutes, which told me much more in regard to the pupils' knowledge of their topography, than the most prolix verbal recitation could possibly do. This rapid mapping, of course, precludes the extensive use of "construction-lines," and indeed, with very few exceptions, — some six or eight — the more the complicated triangulations of some of our compilers, and the concentric circles of another are prohibited, the better; for, in some cases, the construction-lines require nearly as much memorizing as the outline of the country itself. I have had pupils who, without any suggestions, have made some few simple lines and points to guide them in the work. To this I would never object, for whatever one invents, he can generally use to advantage.

Imaginary journeys are very useful in assisting the pupil to become familiar with the courses of great routes of travel and commerce. To lade, in imagination, a vessel with the exports of one port, guide over the proper courses to another, exchange a part or all of its cargo, visit several other ports, making suitable ex-

changes, and finally return to the starting point with a salable cargo, requires a knowledge of many useful geographical facts. Short voyages can be traced very early in the course, such as from Boston to New York city, to Albany, etc., and may be gradually extended until they include a journey around the world, partly by water and partly by rail; and if different pupils are required to give written descriptions of various important places along the route, each may contribute very materially to the general knowledge of all. I have known excellent results from the following method of tracing these journeys, especially among younger pupils. Let the teacher or one of the pupils commence somewhat in the following manner: "I start from a city which is noted for its great lumber trade, sail southerly down a river and bay to an ocean, southerly and southwesterly upon this ocean to a strait, westerly through this strait to a bay, northwesterly upon this bay until I reach the mouth of a very large river," etc. Call upon some pupil, — "the one least likely to know" — to state where the vessel is at every turn. This will keep all on the alert for new developments.

The ocean has always been, and of necessity must continue to be, "the great highway of the nations." Rivers, since they often afford access to the interior of the country, have also been great highways, and, to a certain extent, will continue to be, but from motives of economy mainly; for since the advent of the "iron horse," man has become comparatively independent of rivers as means of communication, and we now find cities springing up which have no water communication with the great markets of the world. Ought we not, then, to give more attention to the great trunk lines of railway in our country? May not these be profitably taken up by means of imaginary journeys?

Latitude and longitude should receive their proper share of attention. The degree of latitude being, for all practical purposes, an invariable length, gives the learner but little difficulty, if he has mastered the subjects which should be presented under the head of "circular measures." Let the subject of longitude be held in abeyance until the pupils can easily and readily find the latitude of any given place, and also are able from memory, to trace the equator, the tropics, and the parallel upon or near which they live, entirely around the earth, that they may not be surprised in later years to learn that the central part of New England is about as far south as the sunniest regions of "sunny France."

Longitude is more difficult for the learner to comprehend, and the manner in which most text-books and many teachers treat it, makes it even more difficult than need be. Practically, the meridian of Greenwich, England, is the primary meridian to all English-speaking people; hence, taking any other as a prime meridian, except in the review of unusually advanced classes, tends to confusion. The variation of length in different degrees of longitude, needs very careful explanation with the globe, although I have found that the cutting of meridian lines upon the rind of a large orange in the presence of the class, has often given clearer impressions of their relative positions, than the use of the globe gives. But before commencing this subject, be sure, be *sure* that the pupils know that a degree is one three-hundred-and-sixtieth of a circumference, that is, distance measured upon a curved line. The lack of a clear conception of the meaning of the word *degree* occasions more difficulty in obtaining a correct comprehension of degrees of longitude than all other causes combined.

The length of a degree of longitude at the equator, and at the learner's latitude are worth memorizing. A knowledge of the latitude and longitude of a few places which are easily remembered, is frequently of great assistance in estimating the latitude and longitude of many others, such as the learner's place of residence, London (or Greenwich), New Orleans, 30°, 90°,—always giving the latitude first, — St. Petersburg, 60°, 30°; Gibraltar, 36°, 6°; mouth of the Nile, 33°, 33°; north-eastern point of the Mediterranean Sea, 36°, 36°; Calcutta, near the Tropic of Cancer, and 90° east, or as far east of London as New Orleans is west of it; the Sandwich Islands, as being near the middle of the Pacific Ocean, on the border of the torrid zone, and near the dividing line between east and west longitude. Tracing the meridian of the learner's place of residence around the earth is a good exercise.

The globe should often be used in tracing journeys, and indeed in all the teaching of geography; and yet, how few of us use it familiarly and understandingly! Go into many of our schoolrooms even now, and the globe is either not among the school apparatus, or is practically ignored if present. Two causes, it seems to me, combine to produce this state of affairs. The first is, that many of our teachers never saw their teachers make any very familiar use of the globe. The second is, that so many of our school globes are intended for astronomical studies, — or for show, — and are so encumbered with machinery, that the teacher is hindered, and the learner confused. Could not any one, with a ten-inch globe, mounted upon a simple, upright standard, with a single wire inclined at the proper angle for an axis, do much more toward giving a clear understanding of the form of the earth, its parallels, zones,

meridians, position, and motions, than he could with the most elaborate, brass-trimmed, tripod-mounted ornament? For the student in astronomy, I would allow all the accessories which even Yankee ingenuity can produce; but for the great mass of the pupils in our common schools, the simpler the better.

It may be a matter of little consequence, but I much prefer that the globe should not be used in any but the correct position, — with its axis leaning toward the north, — and this preference was very much strengthened by observing the labors of a teacher, who was endeavoring to explain the rotation of the earth, all the while using the globe with its axis inclined toward the southwest. Is such carelessness excusable? Could we have in our schools a cheap globe for reference, with a diameter of three feet or more, it would far exceed in utility the volumes of maps which we now have, and would also give the pupil an accurate idea of the comparative areas of different natural or political divisions, and their directions from each other, and from the student, provided the globe were kept in its proper position?

Few subjects which are taught in our public schools can be so treated as to assist more in cultivating the power of imagination than geography. One method of doing this, is to take what may be called a bird's-eye view of some portion of the earth. Imagine, for a moment, a lofty observatory upon the extreme northern point of South America, from whose summit you are enabled to see the entire length and breadth of that vast peninsula, and direct your gaze to the east, to the south, to the west. Can you see the restless, rolling Atlantic, the stormy cape, the placid Pacific? Do you behold the huge mountain-wall of the Andes, stretching for more than four thousand miles along the western

border, with the mighty crowning cone of Aconcagua far down the line? Behold the smoke curling up from the summits of Pichincha and its companions, rendered forever famous by the great Humboldt. Can you catch the gleam of Lake Titicaca from its dizzy height of thirteen thousand feet, with an area one-half as great as the State of New Hampshire? Far away to the south, see the strait through which sailed the first circumnavigators of the earth. Look at the sterile, shingly slopes of Patagonia! See the salt lakes of the Argentine Confederation, and nearer, the waving pampas, with their millions of cattle and horses, and nearer still, the vast forest plains of the mighty Amazon, teeming with life, both animal and vegetable. Almost at our feet, if it be in the rainy season, we may admire the flowery lands of the great Orinoco valley, where a single week suffices to change a seemingly arid waste to a most gaily-colored landscape. Behold the spice groves of Guiana, the coffee-plantations and diamond-washings of Brazil. See the almost deserted silver mines of Peru and Bolivia, lying idle from even the lack of such energy and enterprise as the iron heel of Spanish greed and cruelty crushed out more than three hundred years ago. These are but a few of the many interesting sights which we may view from our lofty perch. Change now our watch-tower, and take another view of the same scene. Change it again and again, until familiar with the view from any point. Do the same with other portions of the world, and look at the people, their dress, their dwellings; observe their customs; behold their cities; and the mind must expand with the exercise.

Can we say that the study of geography must take rank with the least important of our common-school studies, or shall we, by presenting it in such a manner

as to exercise various mental powers, place it in its true position in relation to other branches, and even to art itself?

There are many other points relating to the teaching of this subject, to which your attention might be called did time allow. It was not my intention to present to you anything profound, had I the ability, but to add to the variety of the papers presented here by bringing to your minds the every-day, matter-of-fact work of the common school. In closing, then, let me say that if any words of mine have met your approval, or have tended to make the labors of any teacher lighter, and yet more effective in the future, I shall feel that my work has not been in vain. If, on the other hand, anything tending to inculcate erroneous ideas or principles has been uttered, most gladly will I welcome the correction.

LECTURE III.

Elements of Natural Science in Our Public Schools.

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No part of our educational system receives so many complaints as the Common School. Great burdens are laid upon it. Like an over-taxed servant, it does not fulfill expectations. We find some elements of its reform and greater efficiency in answering the question, What place should the elements of natural science have in our public education?

Public education includes neither that of the university nor the kindergarten. The district school and the graded system, including the high school, are properly maintained by the State. We must meet, at public expense, the wants of the average pupil in ability and social position. We must teach what will make the best citizens out of the masses of youth under our care. The question divides itself into two. Can the natural sciences be profitably taught the average scholar under fourteen years? How should they be taught the advanced pupil in the high school?

We admit the plea of the radical teacher, that whatever is, in the practice of the past in regard to these

studies, is likely to be wrong. Yet we would be wary of the zealot of science. He is often but a theorist, holding firmly his own, while he attacks other systems of truth. We believe that the sober experience of ages is a factor in the educational problem which must always determine the value of the unknown quantity sought.

Our first inquiry leads us to distinguish between the *natural* and *artificial* studies to which the child is introduced. The child's mind is an instrument for acquiring rather than using knowledge. He voluntarily begins the study of nature, "the whole world of force and movement in time and space." Here he goes to school long before his parent sends him. His five senses take him singly, hand in hand, by twos, or all together, like loving sprites of the forest or field, and lead him, going out and coming in. His school walls are Heaven's canopy; its precincts are the material world. He finds text-books in the field. In the light or shadow of nature's curious workmanship, he knocks at many doors. He listens long for a friendly step. He touches with child-hand many forces, and tries to grasp them. His studies are natural, for they are in the order of his mental development. At this school he is happy. Study is play; play is study. The objective part of mathematics unfolds to him in the shapes and numbers of things. He begins physics with the weight of his toy, or in watching the ripple and dash of a brook, or the whirl of a water-wheel. He opens his botany when he plucks the flower, distinguishing color and form. He notices the material of rocks, and gathers varied stones like a zealous mineralogist. He curiously observes the fire. He tests by all his senses the etherial sunbeam, and even questions the stars of their rising and setting.

But the State interrupts this self-directed, yet divinely planned course of study. *Artificial* studies must disturb his delightful dreams. His knowledge must be made practical. He is therefore taught language before he has acquired materials to express by it ideas. He must accustom himself to artificial types of language and the sounds it contains, just as the Chinese scholar "backs his book" in rote recitation of incomprehensible symbols. He is pulled up into practical arithmetic, and made to solve problems which he will not use for twenty years. At eight he is expected to be a skilled penman in a chirography invented by man or demon; at ten, a master of coast lines, and the productions of countries never heard of out of school; at twelve, an artificial orator, and an author on the most varied subjects. He is finally presented to the State as a candidate for citizenship, with a decided aversion to abstract studies, and his most valuable powers of observation hopelessly dwarfed.

But right teaching requires that the child's powers of knowing accurately should be developed, and hence should begin and largely continue with his senses. Words and numbers, over which so much time is spent in reading, spelling and arithmetical problems, are valuable to his mental development, as they are associated with things really known. Hence the elements of science furnish the proper material for such study. Knowledge is not power to the child, if it is abstract. He cannot use knowledge which lies beyond the sphere of his daily observation and experience. What the State needs is intelligent citizens, and intelligent youth from whom they can be made. These come of the power of knowing and judging accurately. We claim for the Natural Sciences this effect on the child. They

deal with facts more sensible than those of arithmetic. The parts of a leaf or a flower are definite, easily comprehended, and classified with certainty. This is true of the nature and species of the common animals, shells and insects, the constituents of a stone, the qualities of an acid or gas, the history of a rock traced in forms of life, the nature and effect even of geological changes.

No wide range of knowledge is required to understand definitely and surely scientific facts simply presented to the youthful mind. It easily comprehends them as a whole. We claim, therefore, that to whatever degree the reasoning faculties should be developed to furnish the child-mind with power, this is best secured by its reasoning on facts and things rather than on ideas of the imagination, or history, or morals, to which children's studies are usually confined. The last knowledge gained by man is the correct understanding of human nature, or the causes of human actions. The sciences teach the relations of cause and effect in their clearest manifestations. With enlarged comprehension the child may learn the secondary character of causes. He will trace their relation to effects with the certainty of conviction to his mind. Thence will be imparted the element of *positiveness* to the pupil's acquirements and habits of character. He learns to act unwaveringly on what he knows, and to know positively that upon which he acts. Correcting by his own observations the conclusions to which he is led by the inductive methods of science, he gains independence in thought with that confidence in his own powers of judging, which are the safeguards in his character and of his rights as a freeman under our republican institutions.

Thus early introduced to the elements of science, the foundations of his character as a citizen are more

broadly laid. The child becomes more excursive in thought, more inventive through familiarity with the mechanisms of nature, and more appreciative of the wealth and beauty of his country's resources. Taught to observe, he never ceases to be affected by the changing lines and hues in nature which his daily vision embraces, and the elements of a true esthetic culture find place in him which will add to his social worth and power as a citizen. A child confined as most of our pupils are to the reading, writing, and arithmetic method of discipline, might as well be brought up in a desert as in the world of beauty and power which surrounds him. His eyes are gradually closed to a thousand alluring truths ; his ears are dulled to the myriad voices of nature.

It is a just inference from these considerations, and an acknowledged fact, that, to a majority of pupils in the public schools, the acquiring of knowledge is uninteresting and positively irksome. The old idea that knowledge is for discipline is faithfully maintained in our education. Yet knowledge is one of the natural desires of the mind. The true science of education will make it a pleasure. This will require for the senses larger opportunity than they now enjoy. Moreover, we owe to the State and its free institutions, to raise the standard of intelligence and culture among the people, among mechanics, farmers, merchants, and laborers in the mill or the street. A discernment of the true nature and qualities of things in their daily use will secure this far better than drills in spelling, arithmetic, and grammar. The mass of our citizens are not intelligent enough to understand one-half the instruction contained in a good weekly newspaper.

We make, therefore, this demand for the sciences—first, that they have an equal place with the usual

studies of primary and grammar and district schools; secondly, that our teachers be required to make plain the elements of the sciences to pupils below fourteen years of age, at the expense of rote-drills and problems in arithmetic, grammatical analysis, spelling without definitions, and the time spent in preparing for pretentious written examinations, imposed at too early an age, that have become one of the worst abuses of an artificial system in public-school work.

We are concerned next with the *methods* of teaching these sciences in district schools, or grades below the high school. The efforts of authors of elementary text-books in science are not entirely successful; most of them are still too technical. There is less vividness in statement of the facts of science, less personification and poetry of the study than a child's apprehension demands. The ancients taught their children the forces and sounds and shapes of the waters and fields and forests by personifications of nymphs and dryads, gods and godesses, in whose histories and habits they were personally interested. So should the stories of insects, fishes, mollusks, birds, and well-known animals, or of plants and stones, be told without text-books by the teacher, with scientific truthfulness as to their modes of life and motion. Thus children would become familiar with their living forms. With text-books still defective, the teacher's opportunity lies in what President Hill calls the incidental method. Let her have specimens of minerals, leaves, insects, flowers, pictures of birds and animals, and simple apparatus for illustrating chemical and physical forces, in order to make real to her classes the subjects of the lesson. By a hundred well-selected stereoscopic pictures she could teach physical and political geography as effectively as the shapes, circles, and

seasons of the earth by a globe. Thus the text-book in the hands of a suggestive and excursive teacher will become secondary to her personal power to make knowledge real and interesting to the youngest pupils in her classes. Yet the text-book in science will give the study equal dignity to the arithmetic in the mind of the scholar, while it corrects the unscientific or garrulous tendencies of the teacher.

Moreover, no other studies will so naturally develop the personal power of the teacher. Proceeding by the method of nature from step to step, from the known to the unknown, she will awaken enthusiasm in the class, and from the fullness of her devotion to the subject there will be an overflow into the minds of the pupils. Rote-teaching in these elements of science is utterly defenceless. Every class of facts and every principle involved should have illustration from the wide range of nature. The *living* way of Sauveur in language, should be applied to the sciences. Every sense and power of the child can be grasped and applied to them by the live teacher.

The *order* of teaching the sciences should be that of nature itself. The elements of geometry and numbers first demanded by the child's mind, should be taught with the materials of science, not with meaningless blocks. Rather take plants with their leaves, flowers with their petals and stamens, to familiarize the child with numbers and geometrical shapes, and at the same time interest him in the materials of botany and physiology. Mineralogy and natural history, with nearly all their more obvious facts, could thus early become known. With more advanced ideas of arithmetic, should be associated the effects of the forces and the laws of chemistry and physics. The grammar-school pupil or

the graduate of the district school will thus have been introduced to the whole range of sciences, in their elementary forms, instead of being ceaselessly confined within the dreary region of abstract truths. His self-activity will have been so awakened that, unlike the forlorn prisoner who, released from thirty years confinement in a dungeon, found himself a stranger in the world, the pupil will behold the work-yard, the shop and the play-ground peopled with school-day acquaintances, suggestive of the most interested inquiry and investigation.

In the high school and academy, the sciences, which here have an unquestioned place, should now be pursued with reference to the taste and interest of the pupil. The elementary facts and principles already accurately acquired, should be subjected to systematic and practical study. The pupil should begin to study the philosophy of the science, and be taught to handle the materials with the constructive facility which the teacher possesses. He must be made a practical chemist, if he elects that study in the course, or a practical botanist, or an experimental philosopher, however young, in physics or mineralogy. Let him pursue one or more of these studies with such advance in ancient and modern languages as his time and strength will allow. But we assert, that an education carried so far as the high school at the public expense, should have the best teaching the school affords for these studies in science, since they are far more essential to his good citizenship than Latin or Greek, unless he is to enter the professions. Only then can they properly be held in waiting for the larger opportunities of college study. The principal of a high school in New Hampshire, whose salary nearly equaled all that his three or four assistants re-

ceived, has spent this year one hour daily of his time in school on a single recitation of a single scholar in Cicero. Too many instances can be pointed out in New England of the best strength and experience thus paid for by the community, devoted to half a dozen favored pupils.

In this higher grade of schools, from which most of the pupils go directly into life's business, the future needs of the scholars should determine which branches of science shall be faithfully and thoroughly studied. The enforcement of a fixed course of study in the high school, before graduation, occasions loss to the pupil and to the State. The district school and the academy have furnished far more noted scholars and citizens than the graded system, as it is now conducted, is likely to produce. Too many studies are required. The sciences, begun too late, are so slightly and cursorily passed over that they can produce but inferior effects in contrast with the careful drill in languages and higher mathematics. With these they have not been fairly compared. Who will say that far more discipline and practical power for an intelligent citizen would not be secured by investigating the properties and combinations and effects of an acid, than by the exhausting efforts made in collecting the changes in the root of a Latin verb?

There certainly should be no conflict between the important studies of language and literature and the sciences; but the future of the pupil, not the classical tastes and reputation of the teacher, should determine the time spent on each in the education which the State is expected to give to her youth.

One turns from the marvelous products and natural resources of our country, so well displayed at the Cen-

tennial as the offering of the United States Government, to the grand exhibition of American inventive genius in the acres beneath the roof of Machinery Hall. There one sees that the treasures of the earth have been the stimulus to those powers and triumphs of the mind. Our public education must furnish minds from the masses, to utilize to a still more wonderful extent these treasures for our due national growth and power in another century. These minds must early be directed to the sciences of nature. As Sparta trained her youth from earliest years for war, our public school must inspire zealous and skillful devotion to our material industries for the more sacred uses of peace. Thus shall we give to the world untold combinations of physical and chemical forces, which, like the American telegraph, shall promote a civilization worthy of the highest Christian nation.

In a book-case containing three hundred publications for English workmen, exhibited by one publishing house of London in the main building of the Centennial, two-thirds are of a scientific character. A glance around that case, through the long avenues filled with the magnificent exhibits of the industries of Great Britain, carries conviction of the influence of such works, intelligently read, on a nation's character and prosperity.

America needs thousands of zealous educators who believe in the power of these sciences to develop and wisely inform the youthful mind; like Farraday, who, we remember, began to teach boys and girls twenty years ago in crowded lecture-rooms, the philosophy of a candle, which have been continued with the same devotion by Tyndall in his holiday lectures on electricity, to juvenile audiences. Men like Huxley, Roscoe, Balfour Stewart, Geike, Foster, and others equally distin-

guished, would not apply themselves to the authorship of primers of science, but for the conviction that the truly scientific mind must be awakened to prosecute successfully these studies in after years for the enlightenment of the people. With such helps, we shall, in a single generation, have a hundred eminent scientists in America where we now have one.

We claim, finally, that the State needs thus early to educate her youth in science, in order to establish in them a reverent belief in God, and in moral truth. We argue this from the scientific character of our most eminent religious teachers, and the reverent attitude of mind of a majority of the eminent scientists of the age.*

The sentiment of scholars a century ago, when literature, logic, and philosophy prevailed through a classical education, was to a greater extent infidel in character, than in the present age when scientific study is having free course. We must begin early to counteract the materialistic tendencies of science. Then the mind familiar with these facts and principles will not easily be swerved through mature inquiry, and into disbelief of the great things of religion and moral accountability. Facts which have dropped from the Divine hand, like rain from the clouds, will be associated with the fear and goodness of that Being whose providence everywhere surrounds us. Then the speculations of science in the evolution of worlds or species, will no more shake

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* We need not greatly fear the materialistic effects of such studies, when one of the pronounced scientists of America, Professor Gray, tells us that Aristotle still expresses the worthiest thoughts of the modern scientific investigator and reasoner, in these words: "For by the primitive and very ancient men, it has been handed down in the form of myths, and thus left to later generations *that the* Divine it is which holds together all nature.—*Darwinia.*

the man's faith in God and his law, than the stupendous fact of a world of beauty and light evoked and proceeding out of the night of chaos, which we learned from the Bible at our mother's knee, staggers our faith in the Divine Word to create worlds in any way, or ever led us to distrust the Infinite Wisdom which planned and still upholds this order of things by the word of Him, "in whom all things consist."

LECTURE IV.

Moral Instruction and Discipline in the Study of the Classic Languages and Literatures.

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The object of this paper is to set forth the possibilities of moral instruction and discipline offered by the study of the classic languages and literatures. The moral influence of any study is a most important consideration in determining the place and value of that study. If it can be made to appear that classical studies, besides developing, cultivating, and tempering the intellectual faculties, may also be made to render important service in the formation of character, they will establish a claim on our esteem which is not generally recognized. Assuming that every teacher desires to make the most of the opportunities for moral instruction afforded by every subject which he teaches, I shall offer some suggestions with a view to enlarging, or at the least to defining, such opportunities in connection with classical studies.

All study, rightly pursued, is a moral discipline. It keeps the moral powers in constant exercise. Not only does it, of necessity, exclude immorality for the time being, but it keeps the mind in the active exercise of

virtuous endeavor. To study well is a kind of virtue. To be studious, even as a boy is studious, is to practice the virtues of diligence, patience, and self-denial; it is to be steadfast to purpose, resolute in action, dauntless before obstacles; it is to prefer the future to the present, things invisible to things of the senses. In the ordinary studies of a faithful and energetic boy, there is both room and call for real moral heroism. It is doubtful whether the after-life of the man, however large the field on which it is displayed, or however great the forces with which it contends, passes through severer moral struggles, or exhibits nobler heroisms, than those witnessed in the student-life of the boy at school, or the young man at college. If it were fully understood by parents that to maintain a high standing in a first-class public-school almost of necessity pledges a boy to the exercise of some of the highest virtues; that, in fact, such a school presents, in its intellectual requirements, some of the strongest incentives to virtue which the boy-nature is capable of appreciating,—parents would not so often forego for their children the advantage of such a discipline for the sake of a premature entrance on business, or of some other questionable enterprise.

While we allow to other studies their full share of wholesome moral influence, it may be claimed for the study of the classics that it touches more closely the moral side of our nature, and introduces the youthful mind more naturally and easily to moral ideas and themes than any other studies.

In the first place, the study of language, properly conducted, is in some respects the study of a moral science. Language is a structure in which moral elements bear an important part. Every language has a moral character of its own, and is the resultant of moral combined

with intellectual forces. Thus the Hebrew language, as a language, apart from the thoughts it has been employed to express, has a distinctive moral character, not easy to analyze, but broad and patent as a fact. So have the Greek, the Latin, the German, the French. If it were possible for us to separate entirely the language and the thought; if we had the Greek language alone without Greek thought, as we have the Latin language in Terence with Greek instead of Roman thought, we might read in the languages themselves; in the flexibility, the grace, the delicate shading, the great compass and various melody of the Greek, and in the regularity, the precision, the ceremonious propriety and dignity of the Latin,—the distinctive moral traits of these two peoples. And the same remark holds good of individual writers. The study of any great writer's language becomes largely a study of his moral character. Great men, like Cæsar and the Duke of Wellington, unconsciously write themselves great in every line of their grandly simple style. Cicero lets his vanity, Voltaire his malice, Rousseau his sentimentalism, appear in the turns of their phrases. Gibbon is cynical, Johnson dogmatic, Tom Moore voluptuous, in the very form of their periods and the tone of their cadences. The old proverb says, "There is truth in wine." There is truth, too, that is unconscious utterance of character, in one's style of language. It reveals the entire man better, probably, than anything else except the sum total of his acts.

Now bear in mind that in what are called classical studies, we are actually studying three languages,—the Greek, the Latin, and the English,—and at the same time are studying the literature of two of these languages as represented in its greatest writers; and

that the method of studying both the language and the literature is such as to bring the moral qualities of both into direct contact with the pupil's mind. I do not say that the moral education thus secured is of necessity intended by the teacher, or consciously received by the pupil, but that it must be a powerful, and may be made a wholesome influence upon character. In studying these languages and literatures, the pupil is putting himself under the teaching of the races that gave to the world its civilization, its laws, and its manners; the races through whom all the great moral ideas which make human life what it is have been given to the world, save what has come to us from the Hebrews. If we ask what Greece has stood for, and what Rome, in the moral development of mankind, we shall get our answer in certain great moral ideas, wrought out by their history, articulated into their language, crystallized into their institutions, and so bequeathed to the world for its guidance in the path of progress. To bring the plastic mind of youth into close contact with these formative and representative ideas, is to put him under the same process of moral training through which Divine Providence has led the world itself. If it should be suggested that those who have the perfect revelation of God's will in the Christian Scriptures, do not need to go through these preparatory stages, I reply that the individual character still needs to be subjected to very much the same discipline as that which was applied to the race. I appeal to all who have had experience in watching and assisting the moral development of youths, whether the same questions do not arise, the same dangers do not emerge, the same succession of moral phases and the same progress of moral ideas do not appear in each school or college class, that we see on a

grander scale in the moral history of the world. I might state my point differently, thus: Most persons have a period of moral infancy, a time when they begin to learn the alphabet and elements of morality. It does not always come in youth. It often comes quite out of date,—sometimes after the individual seemed to have made considerable attainments in spirituality. In such cases, the elementary work in morality having been omitted, there has to be a fearful breach and a temporary chaos in the moral life, until the foundation can he properly laid and the structure of character begun anew. It is of the utmost importance that this adolescent stage in moral training should come in youth; that these juvenile questions should get started and laid; these crude notions be avowed, exposed, and abandoned in good season. Now I venture to say,—and the experiences of many Christian scholars sustain me in the assertion,—that a boy often finds his own moral state more nearly paralleled, his own queries echoed, and his mind more naturally led along, by what he reads in Cicero and Æschylus, crude and false though much of it is, than by ethical writings, which, soaring high in the serene air of Christian perfection, do not touch at a single point his unfledged moral experiences.

And this leads me to a remark which the classical teacher must have often made for himself, that classical, especially Greek literature, is far more religious than modern literature. It might be characterized in the words St. Paul applied to the Athenians: "Very religious." It is impossible to read studiously the Greek historians, poets, philosophers, without confronting, on almost every page, some one of the great religious questions which interest all thoughtful persons, and which deeply affect moral character. The Greeks were not

shy of religious suggestions, as we Anglo-Saxons are. Compare Shakspeare and Sophocles, the greatest English and the greatest Greek dramatist. The religious allusions in Shakspeare are very few; his reticence is not the contemptuous silence of unbelief, but the self-restraint of deep and awe-struck reverence. Sophocles, and the Greek poets generally, pass from what we should call a secular to a sacred theme and tone with the utmost ease, and without being conscious of any transition from one sphere of thought to another. This characteristic of Greek literature compels the classical student, in spite of himself, and often without being fully aware of what he is doing, to open his mind to the great questions concerning God and man's accountability and the soul's hereafter. In saying this, I shall not, of course, be understood as suggesting that the teacher "improve" an ethical maxim of Cicero, or a religious reflection in a Greek chorus, into a homily addressed to his class, and so turn a good recitation into a poor Sunday-school exercise. All moral instruction from this source, in order to be effective, must be indirect, suggestive, adapted to stimulate thought and inquiry, rather than decisive and magisterial. And yet I venture the assertion that no bright youth, studying under an active-minded teacher watchful of his opportunities, can have read the ordinary school and college classics without having entertained in his mind, with more or less seriousness, almost all the great religious questions that have occupied the best thought of mankind.

It may be supposed by some to be incumbent on me, at this point, to notice an objection sometimes urged against classical studies, and very strongly put by John Foster in his "Essay on the aversion of men of taste

to evangelical religion,"—that is, the danger of imbuing the youthful mind with paganized ideas of religion. This is one of those objections to classical study,—and there are many such,—that are rather plausible than real. The youthful mind runs about the same risk of having its theology confused by incursions from the Greek Pantheon that it does of having its astronomy disturbed by the fantastical guesses of the Pythagorean system. The veriest tyro in the classics makes a difference in his own mind between the *religious* ideas and the *mythological* personages and events of Greek and Roman literature. The one he sees to be the product of the conviction and the conscience. These ideas were seriously entertained; they impress him accordingly; they stand as links in the chain of comparative ethics, or as interesting facts in the history of natural religion. He instinctively compares them with the tenets of Christianity, and allots them their value according to the nearness of their approach to the doctrines of revealed religion. That they come to him with any authority, because they are found in the classics, or that in their attractive guise they steal into his heart and his creed, may be dismissed as a chimera. The alarm is the product of no man's experience. As for the gods and goddesses, the intrigues and scandals of classic mythology, these he perceives to be the products of a playful and often unchaste imagination, and they have no more effect on his theological opinions than the fairy stories of his infancy, or the machinery of the poets of his own race.

A more plausible objection is sometimes brought against the reading of the classic authors on the ground of their impurity. Plato himself objected to the drama for this reason. Let it be at once admitted that an un-

chaste literature is wholly unfit to be "turned with daily and nightly hand" by boys and girls. This position need not be argued, but the admission would rule out a very large part of the dramatic literature of all nations—half of the English and German, two-thirds of the French, three-fourths of the Italian, by far the larger portion of the Elizabethan Drama, almost all that of the Restoration, more than half the novels since Richardson's and Fielding's, and especially those written by women. By the side of the Gothic and romance literatures, those of Greece and Rome, especially the former, are of remarkable purity. Search the whole range of poetry, pagan and Christian, and where do you find so chaste a poet as Homer? Shakspeare certainly is not, nor Milton, nor Dante, nor Tasso, nor Goethe. Till you get to Scott, you will hardly find him, and you lose him again in the line of the Byrons, the Moores, the Morrises, and the Swinburnes. That there are gross passages here and there in the classical writers, on which the conscientious teacher would not wish to have his pupil's mind rest for an instant, is too true; it is none the less true, because such passages occur more frequently in modern literature; this fact, however, relieves classic literature of the odium of being especially guilty in this respect, and enforces, not on classic teachers only, but on all who direct the reading of young persons the duty of watching against evil from this source.

Let us now specify two or three of the representative moral ideas which are prominent in classic literature, and which have great educating power over young minds. First, there is the idea of virtue as consisting in self-control. The Greek language itself is a constant lesson of self-control. The Greeks, better than any

other speakers of human language, understood the power that resides in not saying too much, in curbing and restraining language, and thus mastering it, and making it do their bidding, instead of giving loose reins to it, and thus being mastered by it. This same idea of self-control is dominant in literature and art, in philosophy and life. Greek sculpture is the embodiment of it in marble. Both Plato and Aristotle, in different ways, made it the essence of virtue. The typical Greek, spare in form, moderate in his pleasures, philosophical in his enthusiasms, chaste in art,—a manhood filled out on all sides, yet nowhere in excess,—is a good ideal to contemplate, and especially good for our typical American boy to study, impetuous as he is, ready to run into wild extremes of fancy and passion. To get this one idea thoroughly inwrought into the brain and moral sense of the American boy, is worth all that it costs to learn Greek.

Another very prominent idea in classic literature,—much more prominent than in ours, at least up to this centennial year,—is public virtue. There is no modern literature in which the state, and all the talents and virtues which qualify men to serve the state, occupy so conspicuous a place, as they do in these classical writings. Not that the ancient statesmen were all men of immaculate virtue, but all the resources of language and all the force of public opinion were employed to prevent and punish public corruption, and to ennoble public virtue. The man who would take no part in public affairs in Greece, drew down upon himself and upon the name of a private man, the imputation of idiocy. The man who proved false to his trusts, is consigned in Greek history to an infamy paralleled only in the fate of Benedict Arnold. If the civil service reform, to

which both parties have, in this season of courtship, pledged eternal fidelity, should become a fact, I should like to see inscribed over the entrance to high public office at Washington, "Let no man enter here who has not read Thucydides."

The one great moral idea which runs through all Roman literature and Roman history, is the supremacy of law: the one great and comprehensive virtue which Rome ever exemplified and bequeathed to civilization, was obedience. The grandeur of Roman character as it rises before us in its Catos and Scipios, its Fabii and Antonines, is the austere grandeur of men who stood ready at any moment to sacrifice everything personal at the high behest of the common weal.

Teachers, it is good for our youth to be put under the training of these great moral ideas, to be subject to influences that come from a literature which enforces and exemplifies self-control, public virtue, and the sacredness of law. There is something healthful and invigorating, — something in the highest degree, and in the best sense, *practical* in this training ;—something that we can by no means afford to give up for anything that French and German literatures, valuable as they are, can offer as substitutes.

My half hour's limit leaves me time for only a few words on the *methods* of classical instruction as affecting character. A boy may be trained in the classics in such a way as to become thereby an adept in verbal pedantry, and a small critic in other quiddities, or he may be taught accuracy, truth-telling, and magnanimity. Much will depend upon the system of teaching, and much on the individual teacher. The publication of translations of all the classical text books, has driven teachers to adopt a new and inferior method of classical

discipline: to put the main stress of recitation-work into an irritating minuteness of criticism upon matters which are remote from the main purpose of classical studies, and thus to sacrifice the best parts both of the intellectual and moral benefits of such studies. The best results of classical instruction are to be got by using only text-books without notes, a good grammar, and a good lexicon, and after a thorough preliminary drill in the elementary principles of the language, reading large quantities critically, but not so critically as to prevent the reading of large quantities. If it be said that the translations have spoiled this plan, let us take the ground that the pupils whose moral nature is beyond appeal as to the dishonesty of the course in question, are unfit to pursue the study further, and at all events that the exceptional pupil's perseverance ought not to rob all other pupils of the plan which is best for them. It is pleasant to witness some signs of a reaction against the vernacular style of teaching which is so prevalent, and the narrowing and belittling effect of which has become painfully apparent in the schools where it is carried to greatest extremes. To count the pebbles in the now dry bed of the Ilissus, is hardly worth the while of one who may drink the Chian wine of Homer, or feast on the dripping honey of Plato. Accuracy let us have, by all means, especially that accuracy which is clearly allied to truth-telling, the exact word for the idea, the correct discrimination of the syntactical place and meaning, the true color added by the imagination, and the warmth supplied by the feelings. All these let us think no pains too great to secure. But the conjectural Sanscrit root, the supposititious Arian myth, the microscopic analogy, the millionth dilution of the shadow of a meaning between this and that apod-

osis as related to this and that protasis,—these matters let us leave where they belong: to advanced philology.

But the most important consideration connected with the teaching of any subject, is the teacher's own moral personality. How the classics, or anything else, shall be taught, depends on the kind of men and women who teach them. Give me for my children, strong, thorough-gong men and women, — strong-minded, strong-willed, true-hearted men and women, — and I shall not trouble myself greatly about their methods of teaching. Such men and women are very likely to have peculiarities, and very strong ones; they would not be easily brought over to adopt methods made for them by others. But they have stuff in them; they rouse, stimulate, and fructify other minds. Oh, for a few such men in each State in the classical schools and the professorial chairs, to arrest this triturating process of instruction which is so wearying young men of classical studies! The old name for studies was "the Humanities." Would that we might get back to that idea: that we study the classics for the sake of the manhood, the morality, the broad and generous views of life we get from the study. On this basis, the time-honored classical discipline can be defended against all the assaults of its adversaries. In the hands of competent teachers, men of moral appreciation and enthusiasm, it can be made a most effective agency for quickening and developing the moral nature of lazy persons; and we may rest assured that if it can make good its claim to be able to accomplish this, mankind will not let it die until it be superseded by something that, in this respect as well as others, can maintain an unquestioned superiority.

LECTURE V.

The Moral Element in Education.

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I am to speak, this evening, of "The Moral Element in Education." I use the term moral in its broadest sense, and as pertinent to all the various ways in which human nature is trained; yet with chief reference to the organic instrumentalities and the more formal methods. The subject, if I mistake not, is a timely one. There is a tendency in certain quarters to a merely intellectual training, a tendency which is, in all respects, of evil influence, and which should be promptly and steadfastly resisted.

1. The moral, I remark then, is the principal element in education. Without it, I hardly need say, the process is but a partial one: there are certain powers and susceptibilities of the human soul which you touch not, or touch but incidentally and to little purpose. But what is more, these are chief in our being. Conscience is regnant there, and righteousness is man's crowning endowment. We are *made*, indeed, for the moral and spiritual,—if we are true to ourselves we find in them our end. God is the Great Educator, and it is in this relation to the universe that he does his most

glorious work. That he creates is but initial; he does this, that, in Providence and in his kingdom of grace, he may educate. And in all his processes of training, he not only links the moral with the mental, but he gives to the former the supremacy. It is not alone in the old catechism that we read, "Man's chief end is to glorify God and to enjoy him forever"; it is the dictate of our moral nature, and it is the teaching of all history. Remove the order, make man his own end, and the result will be, sooner or later, a moral chaos, a race of fiends,—"in the lowest deep, a lower deep."

What God does, it is our wisdom and our safety to copy. So doing, we not only embrace in our course of culture the entire man,—doing no half-way work, and so producing no monstrosity,—we give to each power its proper place. We enthrone that only and heartily which has inherent royalty. We do, in fact, just what all the ongoing of life calls for,—all its relations and offices, public and private. What are even the lowest mechanical pursuits, but as the virtues pervade and exalt them,—truth, fidelity, unswerving honesty? What is mere professional skill without integrity? The scalpel of the surgeon, else shall pierce unto perilous wounding; under the tongue of the lawyer shall be the poison of asps; and Satan himself, in the pulpit, shall be "transformed into an angel of light." Your merchant prince shall be a very trickster. Your city official shall be a Tweed. The judge in his ermine shall be as one,

"The wisest, brightest, meanest of mankind."

Your representative, your senator, your high cabinet officer, shall be a sham and a scourge, rather than an honor and a blessing to the nation. The cry sounds forth now from all quarters of our land, and is echoed

in all party platforms,—even where hypocrisy does but pay homage to virtue,—"Let the moral element be exalted." Mere intellectual culture, all experience has shown, avails little to the truest elevation of a people. It may modify vice, but it does not eradicate it. It may give us a certain refinement of crime,—the crimes of the counting-house, the exchange, and the palatial mansion, for those of the lower and rougher walks of humanity; but it has no power to dry up the springs of evil.

2. While the moral element is thus, in the nature of things and in the needs of society, chief in education, it *is helpful if not indispensable to every other.* The machinery of the soul works best, like all material machinery, when it works harmoniously,—every part fulfilling the end for which it was designed. The moral besides—taken in the widest view—is the great underlying force that invigorates all the rest. All history shows this. With the revival of religion, learning was revived. Reach the spiritual element in a community of savages, and you stir the intellectual. You change thus, and only thus habits, wrought into the very texture of the soul. Awaken conscience in the bosom of a sluggish youth anywhere, open his eyes to the beauty and glory of duty, of righteousness, of philanthropy, and you have done for the arousing and energizing of his intellectual being what no other voice of suasion, no utterance of mere authority, would have accomplished. In what a marvelous transformation of intellect, has a moral transformation sometimes resulted. In memory, in logic, in æsthetic perception, — in height and depth, and length and breadth, — you have had before you a new man. In the student-life of how many, has that old saying been illustrated:

"Bene orasse, est bene studuisse."

3. But I observe in the third place, and more at length, what has been already hinted, the moral element *must have its root in religion.* I speak now in no sectarian view. I stand on the platform of our common Christianity, speaking simply as a theist, and as a believer in that authoritative text-book of our faith, the Bible. I utter only what the "Father of our Country" uttered, as he looked into that great future now so grandly unfolding, and what the wisest statesmen have often affirmed. I base my assertion on the very nature of things. Morality is, indeed, distinguishable from religion; and it may, in the mere outward form, exist apart from it,—albeit it is likely to have no great prevalence, and is in peril ever. But in the best sense of the term, it implies religion. In the very conception of it, law and obligation are embraced;—and law implies a lawgiver, by whose word we are bound. There can be no moral obligation to a mere force. I can have no penitence, in the proper sense of the term, for merely infringing the order of nature. I may so disregard gravitation as to break a limb; and there may be sorrow for the pain suffered, the expense incurred, and the time lost; but there can be, in that view alone, no contrition. The soul must be lifted into the sphere of personality, — nay, of infinite personality; it must recognize a Creator, Upholder, Benefactor, Governor, if you would turn to good issues the springs of moral character. Religion is the root of the stalk, of which morality is the fruitage. Even the imperfect morality of the old pagan world was based on religion of some sort, — albeit they had "lords many and gods many." As I insist on the moral element in education, I must needs insist on religion; and I invoke its influence on all our educational institutions.

4. This general view is very well, it may be said, and is not to be disputed. But may not the religious training be carried on *separately from the intellectual?* May it not be remitted to the family, the church, the Sabbath school? We have divers faiths, and there is much denominational jealousy. May we not preclude its workings, by giving in the common school, the academy, and the college, a merely intellectual culture? An important question this, and one that deserves careful consideration.

(1) My first answer is but an expansion of what has been already suggested. It is no dogmatism of sect I plead for; no inculcation of the minor points of denominational faith. It is theology in its broader and grander aspects, and religion as it stands connected with them. I would lead forth the young, not by the brooklets that may water a township, or the river that may irrigate a State, but by the great ocean of God's truth. If I speak to any "hopeless, dark, idolater of chance," who holds to no God and no word of God, to no deathless spirit, but only to a fortuitous whirl and conglomeration of atoms, and who would have the young trained accordingly, I have at present no argument with him. I speak as a Christian, in the broad catholic sense, to Christian men. Standing with them on the ground of our common faith, I would use it in our schools for the engendering and strengthening of that comprehensive morality which can only thus be most effectually promoted. I have emphasized this point, because in the cant of a false liberalism, the cry of sectarianism has been so prominent.

(2) I answer, in the second place, that as morality and its tap-root, religion, can be properly divorced from no attitude or process of the life for which education

fits men, so by parity of reasoning it should be dissevered from no educational process. Why should the preparation be, in this regard, essentially unlike the thing prepared for? Nay, how can it be. In this respect, especially, our many-sided nature abhors a vacuum. If you have not the pure air of heaven, it shall be replaced by mephitic gases. If you have not religion in the school-room, you shall have irreligion. The moral and spiritual element shall grow somewhere, —downward, if not upward. You cannot hold it in abeyance,—you cannot consign it to a temporary torpor, or if you do that torpor shall issue in death.

(3) I answer, thirdly, that if morality and its chief support and safeguard be not cared for in connection with the intellectual training, it will, to a great and appalling extent, be cared for nowhere. Take the children of our common schools, even in forward New England. You need only follow them to their homes to be satisfied that the moral training, which not a few of them receive there, is exceedingly defective,—a mere nullity in many cases, and often worse. If in this important point you would give completeness to education, you cannot rely on home-influences; and in many cases these are but partially supplemented by either sanctuary or Sabbath-school privileges. I shall not attempt to give statistics here; I simply appeal to the various observation of my hearers. If it be so in New England, what shall we say of other quarters of the country,—of regions especially on which a dark shadow of illiteracy rests, or where the population has a large infusion of the foreign element. With the higher institutions, such as the college and academies, the case is not essentially different; only the advanced age of the pupils, and their comparative separation from home

influences, good or bad, renders it the more desirable that they should be furnished with proper moral appliances, and these on the same general plane with the intellectual. Be it that at an earlier period, the spells of home draw the student heavenward; he must have now, in their place, the strong logic and the manly appeal suited to his more advanced period of pupilage. I would not unduly disparage home influences, even when, over a long track of years, they fall upon gray hairs. But with the student in the preparatory school or the college, they cannot, at the best, be wholly relied on; they must be enforced and supplemented by influences that lie close about him, and such as are happily congruous with his age and attainments. If these are lacking, it is a fearful if not a fatal deficiency.

Such is our argument for the moral element in education; it is in the nature of things chief; it is helpful, if not indispensable to every other; to be duly effective, however, it must have its root in religion; and as thus apprehended, it cannot be safely separated from the curriculum of the school, and remitted to other agencies. Such is the general theory. By what means and methods, now, can it best be carried into practice? What instrumentalities are to be employed, and what errors in the use of them, actual or possible, are suggested? I can only touch, of course, and that but briefly, on a few of the points, for which a volume would be insufficient.

1. Among the instrumentalities, I name, first, *the Bible.* If I were pleading only for intellectual or æsthetic culture, I could point to nothing better,—nay, to nothing as good. I might repeat the oft-quoted saying of Sir William Jones, expressing the best judgment of all Christendom: "The collection of tracts," he says, "which we call from their excellence *the* Scriptures, con-

tain, independently of a divine origin, more true sublimity, more exquisite beauty, more pure morality, more important history, and finer strains, both of poetry and eloquence, than could be collected from all other books that were ever composed in any age or in any idiom." I marvel that this consideration avails so little with those professed lovers of good literature who would exclude the Bible from our common schools. But it is not on this ground alone or chiefly, that I would retain it. The writer just quoted speaks in equally strong terms of its "pure morality." And well he may, as many of those who doubt its inspiration readily admit. For it is God's Book, — the transcript, as a rule of life, of his own excellence ; the utterance of Him who knoweth perfectly our frames, our relations, our needs, our destiny. It is the voice of infinite wisdom, commending righteousness to us with a matchless rhetoric ; enforcing it not by the bare precept alone, but by a most condescending logic, by broad historic illustration, and by the peculiar power — heart speaking to heart, — of individual example. There is a vitality in it, as in Milton's angels, "in every part"; a magnetism of sympathy ; an encouraging, uplifting influence,—that of the Cross, especially,— such as pertains to no other book. I would, for that reason, lay it close to the heart of the child as he begins to con his little lesson ; and as years steal on, it should be read by him, or to him, in the high school, the academy, the college. The very fact of its admission and its prominence there, is itself a power. While the memory is both receptive and retentive, I would have it stored with the precious words of God, —the jewels that even death cannot dim. With no sectarian narrowness, but in a generous catholic spirit, I would magnify its great fundamental teachings. I

would put into the hands of the pupil, while character is in the formative period, its divine prescriptions, its models, and its measuring-lines. Nay, though little or nothing be said by the teacher, — and in the common school I would make this concession, if necessary, that the teacher say little or nothing,—if the eye of the pupil does but rest upon it, and his hand handle it, and his lips utter it, so vitalizing is it, that virtue shall go out of it, making him, for all his lifetime, a better individual man, and a better member of the community.

When I remember, in this Centennial year, what the Bible has done for us as a nation, — the dear old Book that came over in the "Mayflower"; that lighted up the gloomy wilderness; that caused the psalm of the Pilgrims to ring through its aisles; that shed the radiance of faith and hope upon "the hill of graves"; that quickened into vigorous life our tree of liberty; that became the corner-stone of our whole political fabric; that has spanned the continent from the Atlantic to the Pacific with that bow of promise whose glorious progressive fulfillment we are now rejoicing in; — I cannot but marvel at those — partakers of our goodly heritage, and some of them bearing the Christian name — who with rude, and I had almost said sacrilegious hand, would eject it from our common schools. I have read and considered their arguments; but, though I respect the men, I do not respect their logic. That logic goes too far; and, as we say familiarly, "runs itself into the the ground." Carried to its *ultima thule*, it would banish from our schools every text-book that implied by a single phrase the existence of God, or angel, or spirit. Only the veriest Sadducees would satisfy their scruples. They speak of the rights of conscience. But have not we consciences as well as they, or those for whom they utter their plea? They ignore the fact, moreover, —

now becoming very palpable, — that the interdiction of Bible-reading in the public schools would by no means satisfy our Catholic friends. It would make these schools rather more objectionable to them. It is against "godless schools" that they make their most plausible and vigorous protest. While I cannot assent to their claims, my estimate of the Bible in public instruction is such, that I would, if necessary, make a liberal compromise. There are some mistranslations, I judge, in the Douay version; but the Word of God, quick and powerful, "is not bound," even by a mistranslation here and there. And I freely declare, that rather than have it cast out of the common school — if the issue should come to that — I would consent that the pupils should all read from the Douay Bible. Better that a thin mist obscure the light of the sun, than that it pass utterly from the heavens.

2. As another important means of moral training, I name next *the character and influence of the teacher*. "It is not so much what you have said that has benefited me," wrote a grateful pupil once to his instructor, "but what you *are*." A great truth was thus suggested. Words are but vibrations of the air. Nay, deeds may be doubtful; they have the highest moulding power only as they spring, evidently, from a pure internal fountain. Being is better far, — I say not now than mere learning, — it is better than mere doing; it is more effective. Let the teacher so bear himself, with whatever modesty and reticence, whatever absence of a forth-putting spirit, that his pupils shall perceive clearly the soul of virtue in him, and it will avail more than all merely verbal demonstrations. It is of immense moment that he so deport himself. Loved and trusted as he is, he will be to them the very embodiment of goodness; and when he does speak for it, it will be with a

voice of irresistible persuasiveness. As the years steal on, the tendrils of early affection will be transmuted into golden links of memory. He will walk with his pupil, as it were, approving or rebuking, encouraging or warning, all along the pathway of life. Gray hairs were upon Whittier, and a thousand memories of his own boyhood were, doubtless, clustering about him, as he sung in his "Snow-bound" of the student-teacher, from "classic Dartmouth's college halls." How important, then, that in filling our chairs of instructor, due heed be given to the moral element. Even a negative disqualification should be decisive. Earnestly should the inquiry be pressed, What influence will be exerted upon the susceptible heart,—upon the conscience easily reached? Will the very presence of the teacher be an incitement to all that is praiseworthy? — or will it commend, rather, to his inexperienced and unwary pupils, what is doubtful, at least, if not palpably wrong? That there is need, on the part both of parents and school committees, of greater vigilance in this regard, no careful observer can question.

3. There may be a help to some of the grandest virtues, I remark thirdly, *in the very fashion of the school curriculum.* It has become, I fear, quite too common to adjust the demands of the recitation-room, in a measure, to the indolence and self-indulgence of the pupils. Instead of the old programme, with its smooth plains and beautiful valleys not merely, but its rugged heights to be climbed, and its deep waters to be fathomed and forded, the effort now is to open before the student a sort of fairyland, in which, without toil or difficulty, he may roam at his pleasure. This is especially true of our collegiate arrangements. A sort of restaurant system is gaining favor, in which unsavory things may be

avoided; and even in the more attractive, you have "a choice of syrups." If the "Hill Difficulty" remains at all in the pilgrim's path, it is quite lawful to turn aside into some easier way; nay, after Hawthorne's conceit, certain modern engineers have essayed the tunneling of the Hill itself. A sort of educational Fourierism is proposed, in which everybody shall find his affinity, and the old repulsiveness of labor shall be known no more. Let us not be misunderstood here. We object not to optional studies at proper stages, and under fitting limitation and guidance. We only fear that our American intensity will carry the matter too far. We believe in the essential oneness of humanity; and so, for general culture, in a well-balanced, symmetrical curriculum, prescribed by wisdom and experience to the tyro in knowledge. We are suspicious of the specialist who has no good foundation of general attainment. We want the firm, well-compacted block of marble, before there is hewn from it a Boerhaave, a Chalmers, or a Webster. And we quite incline to the opinion of a certain theologian, that laziness is a large part of original sin. A peril to the callow youth is this large liberty of choice. The boys are rare, even to the close of the third septenary, who do not prefer a piece of pound-cake, or a saucer of ice-cream, to a plate of roast beef, albeit the latter may best promote their physical vigor. We are afraid of premature and extreme eclecticism in its intellectual relations. And as there is ever a certain harmony and congruity between the wisest mental and the best moral training, we fear it also in the latter relation. It is more or less unfavorable, we apprehend, to the stern old virtues of self-denial and patience and perseverance. It tends to effeminacy rather than a robust manhood, — to a shrinking timidity, rather than

that "courage" which, the Apostle tells us, should be added to our faith, — to the undue magnifying of our self-hood, rather than to moral breadth and comprehensiveness. It will bear, at least, to be wisely and care fully watched.

4. Another help to the moral element in education may be found where, alas, it is frequently not found, — in the *fellowship* it furnishes. Next to the family, there is no earthly association so intimate. In the four years of college life, for example, those who eat, walk, recite, and play together, who are in the same societies, and the same little college enterprises; who have common aims, common trials, common joys, and common sorrows; who, with all the frankness of youth, open to each other, on a thousand topics, their inmost minds and hearts, cannot fail to give and receive thus a potent, moral influence. A strong tie is that which binds fellow-students, and especially classmates together; and if the hand of virtue twine it, it is a precious tie. How dear, is only known when the farewells of a graduating class have been spoken, each, in their dispersion, recalling "the tender grace of a day that is dead," and "the touch of a vanished hand." Or when, as years pass on, they meet each other, as Longfellow has it in his "Fire of Driftwood":

> "We sat and talked until the night
> Descending filled the little room;
> Our faces faded from the sight,
> Our voices only broke the gloom.
>
> We spake of many a vanished scene,
> Of what we once had thought and said;
> Of what had been, and might have been,
> And who was changed, and who was dead."

Many a man has had reason to bless God all his life-

time for a classmate or a roommate, whose every look was a benediction, whose every touch of influence was an incentive to whatever is excellent.

But, just in proportion as the fellowship of our school days may be an inlet of good, so also may it be of evil. And there is nothing pertaining to education that calls for greater watchfulness. So subtle, and quick, and potent, is the contagion of vice, as it gains access to halls of learning, that not only is the most rigid quarantine called for, but, if need be, the sternest eliminating appliances. Humanity weeps at times, I know, over such necessities. Yet, we cannot afford to turn our educational institutions into moral lazar houses. The gangrened hand should be promptly removed, or even the gangrened eye, lest the whole body be affected. I would bear, to the utmost allowable limit, with intellectual infirmity, and even with the foibles which indicate no deep-seated malignity; but the student who is both corrupt and corrupting, should have a speedy exit from the scene he desecrates. Our duty to the uncontaminated calls for it, and to the parents whose hope and pride they are, — nay, our duty to the community. We have quite enough in our land of educated vice,— of unscrupulous avarice, and reckless ambition, for example, — wielding, for its evil purposes, the weaponry which our colleges have forged and furbished. So far as such men can be reasonably identified, which is, I know, not always possible, I would remit them, with "the three R's," to the plough or the workshop, rather than aid them, with much expense of time and treasure and brain-labor and long suffering and dishonor, to reach the high places of the land.

There is a particular evil connected with educational fellowship,—especially with college, and to some extent

with academy life, — which deserves a more extended notice than our limits allow. I allude to what may be called *the ring principle*, as it often pervades and vitiates class associations. We are quite familiar in our country with other rings than those of Saturn. We have rings in Wall street and State street. We have rings at the broker's board, and the merchant's exchange. We have bull-rings and bear rings, and divers other rings, — the demoralizing and economically evil influence whereof, in the circles of trade and finance, are widely deplored. We have had rings of counterfeiters and gamblers and whiskey-dealers, and rings hardly less objectionable in the political world. A perversion of the social tie have they all been. And just such perversion have we, more or less, in educational life. A class in college sometimes becomes a ring, — the members whereof, with here and there a self-sacrificing exception, are held together by a bond not a whit superior to that which compacts a horde of bandits. "My class, right or wrong," is the sentiment! "My class against law and order, against faculty and trustees, against the moral sense of the community, against the world, if need be, and the Maker thereof." We are reminded of the words which Milton puts into the mouth of Satan, as he looks upon the unfallen pair in Eden, and almost relents at the sight of their "harmless innocence." Yet "public reason," he says, — that is, fidelity to his infernal associates, and the cause they have espoused,—

> "Compels me now
> To do what else though damned I should abhor."

Many a man will do, under the influence of class sympathy, and a fancied class obligation, what he would be ashamed of in any other relation. Yet he is grad-

ually fitting himself thus for the various corrupt and corrupting rings which will solicit his fellowship in subsequent life. Pleasant and advantageous as the ordinary class arrangements are in many respects, I have sometimes felt that, unless we can counteract and repress the evil I have referred to, — as we should constantly and earnestly aim to do, — it were better that they should all be broken up, and the most miscellaneous and disjointed eclecticism take their place.

5. I observe, finally, that we should aim, in all respects, at a wise and effective discipline. I have had fears that in the general reaction from the sternness of the Puritans, toward the free and easy habits of the Cavaliers, our schools might suffer. A great deal is said about unnecessary strictness in the way of multiplying rules, and holding students to an exact observance of them. It is thought better, by some, that they should have, not only in the selection of studies, but as to the order of the school, as much liberty as possible. The tendency, in certain quarters, is to regard law as tyranny, — as essentially and properly odious; and exemption from it as best suited to develop, by a sort of real and joyous spontaneity, the highest style of manhood. "Have done with the leading-strings," it is said, "and train your pupils to be a law unto themselves," which means, being translated, to "wander at their own sweet will." I have, for myself, great doubts about this tendency. I have an old-fashioned regard for law,—of whose seat old Hooker spoke truly when he said, it "is the bosom of God." All goodness, I apprehend, is conformity to it; all moral evil is disregard of it. The best moral training, then, is a training to the exact and full observance of it. God magnifies it every where. Its metes and bounds are all about us. We

move ever, in Providence, upon its iron track; and signals of danger, in departing from it, meet us all along our way. If we turn to the spiritual realm, it is the "law of the Lord" that converteth the soul, that maketh wise the simple, that rejoiceth the heart, that enlighteneth the eyes, and that, for all benignant purposes, "endureth forever." There may, it is true, be an undue multiplication of merely conventional enactments, and these may be regarded in the spirit of a drudge or a slave; but the very noblest function of the educator, I apprehend, is to form in his pupils the habit of exact, unvarying, conscientious observance of law. And nowhere upon earth is it more desirable, than in this land of free institutions, of intense individualism, and of juvenile precocity. So much is said here of the will of the people, that each man, — each little man even,—is apt to feel that his own will is the *lex suprema*. Our youth need to be taught, over and over again, that liberty is not lawlessness, but a faithful conformity to all good law. Even the mere conventionalities of school life have an important use. "I desire that you should go through college," said a New York banker to a somewhat reluctant son who had business in view, "for I have observed that those young men, ordinarily, do best in business who have had a liberal education." The banker was right, — a shrewd observer, as he was, though not a college man. The very routine of school life, the variety of duties required, the heeding of hours and of bells; the systematic arrangements, and the very spurs provided for the laggard, all tend to fit one for what will inevitably be required of him in whatever walk of life, and to insure, with the other requisite qualifications, his success in the world.

I add only, as touching discipline, that I have an ever

increasing conviction, — in opposition to all the rose-water philosophy, — of the importance of *penalty*. Human nature was essentially the same in Solomon's days as in ours; and Solomon, with all his failings, was about as wise as a majority of the modern school committees, and even of the modern teachers. God knows human nature perfectly, and His law has its penalties, — even His natural law. We are hedged about by them. The slip on the sidewalk, the careless touch of the heated iron, the eating of some crude and indigestible substance, — a thousand physical mishaps and sufferings, forcibly remind us of them. The moral law has its penalties. Penalty, in a broad view, is but "the graver countenance of love."

It is a truly beneficial element in the processes of education. Use all other means to the utmost. Let kindness do its perfect work, — we cannot insist too much on this. Let the deftest moral suasion be employed. On the ear of the serpent of evil, let the voice of the charmer fall most winningly. You will accomplish something; but you will not accomplish all. Nay, if you have only kindness, however gushing, and suasion, however mellifluous, — if there be no background of penalty, you will accomplish comparatively little. You fail of one of the most effective *didactic* appliances. Let it be understood that, in the last resort, the offender is to be only "talked to," and the talk will be likely to lose its power. The lightning must strike sometimes; mere heat-lightning and peals of thunder will not suffice. Let the tears of pity fall ever in chastisement; but for the sake of every interest concerned, let not a maudlin sensibility banish penalty from your code.

But I must pause. Such are the hints I offer,—brief hints only, — as to the means of moral culture in our

schools. Let the Bible remain, then, as the great authoritative text-book. Let the character and example of the teacher, — not in what he says, merely, but in what he is, — be a constant incentive to virtue. Let even the curriculum be shaped with reference to the highest moral ends. Let the best social influences be sedulously sought, and evil ones be unsparingly eliminated. When all else is done, let penalty, the stern guardian of the law, the benevolent conservator of all that is dearest to humanity, be wisely and lovingly invoked, and though there may be incorrigible ones still, here and there, you will have the satisfaction of having used the fittest means to the grandest end. Nay, you will have the joy, in many a case, of having aided in the formation of character, — the noblest product in the universe, — not only for the life that now is, but for immortality.

LECTURE VI.

The Place of the Polytechnic School in American Education.

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The School is the comprehensive term under which are grouped all the agencies by which knowledge is communicated and increased. All men admit that the school is the prime motor in civilization, and the indispensable condition of a truly prosperous nation. This term, so freely used and so well understood in its practical bearings, it is difficult to define or to trace. It includes the apparatus of education, but not the whole of it; for education has mighty forces at command which lie outside the school, and sometimes, to some extent, counteract it. What has been happily termed "unconscious education," transcends the school, sometimes subordinates its processes, always modifies its results. What the school undertakes to do must be wisely limited and determined by this relation to other educating forces. It will not undertake to shape the precise career of a man by rules drawn from a too curious scrutiny of the characteristics of the child; nor will it leave all forms of applied knowledge to be learned in the wider world; but it will be content with the duty

" . . . . to rear, to teach
Becoming, as is meet and fit,
A link among the days to knit
The generations each with each."

Of the agencies usually attributed to the school, the communication of knowledge, and the means of acquiring and increasing it, are its main end. For these ends, — really one, — the school exists. In learning them, the pupil is taught in the first stage how to do,— in the second, how to know.

Any association of men, no matter how savage, which is, by any fair use of language, called a nation, always contains the rudiments at least of a school. It may as little resemble a modern school, as the savage government a modern State ; but yet it is, in its form and object, *a school.*

How the school began, or how it came to be, are questions full of interest. Doubtless, the teaching of manipulation always precedes the proper discipline of the intellectual faculties, and mixes, to some extent, in all effective teaching. This is the truth concerning the rise and progress, both of national systems of education, and of any particular system.

The rude tuition of the young Briton, Celt, Saxon, Anglo or Norman, in archery, or in navigation, clear and direct in method, and certain in results, was the counterpart, and indeed the spring, of Winchester and Eaton ; and the modern education for modern needs would leave little to be desired were its results comparable at all with those attained by the ancient training for ancient needs. One good scholar outweighs, it may be, a thousand Norman archers ; but every Norman was a good archer, and rendered a clear return for the labor of his training, while the *skillful* bowman received spe-

cial recognition. No one would like to affirm that the same test could be successfully applied to Eaton and Winchester. The first obvious advance in education was the development of manipulation into the fine arts, —the first distinct connection between a trained mind and a skillful hand.

When savage nomads became settled nations through successful warfare, — government being a thing wholly of rulers, and not of the governed, — they naturally began the improvement of their state by agriculture, architecture, sculpture, and ultimately painting. Navigation arising later, spread the gains of the more enterprising tribes among the maritime peoples. Of course, in the development first of the industrial arts, then the fine arts, reliance was placed on manual labor and dexterity, for science slumbered far beyond the dawn of knowledge. With no accumulation of resources, but abounding in industry, acute perceptions, and taste refined by exercise, and controlled by good judgment, the more talented few among the ancients wrought out, with immense prodigality of means, men, and wealth, the endearing treasures of art. The quickening mind guided the dexterous hand, and the work of the hand stimulated and informed the mind, so that manipulation, through the imitative arts, achieved results which, judged by any exacting standard, do not suffer in comparison with the grandest victories of science over matter.

Since these great achievements of manipulation were necessarily confined to a few persons, each artist became, by the resistless magnetism of his fame, and the advantage of his skill, a teacher. Instantly an artist became known, students flocked to his studio. The relation of teacher and pupil is a constant factor in the biographies of eminent painters, sculptors, and metal-workers.

Through these studio-schools, the individuality of the artist was impressed upon the pupils; and, beyond this, the schools of each nation all bear fruit stamped unmistakably with the characteristics of the nation. Greek art is quite distinct from Egyptian, and that from Saracenic. Each is a distinct outgrowth of the national life and character. But the processes of training youth for the pursuit of the fine arts, was the same study of models, and constant practice.

Similar processes of training precisely were in vogue among those who wrought in wood or metal or pottery, for the proper application of art to the common uses of life. The end of all training in handicraft was to combine in one the artist and the artisan. Of all the nations of old time, the Jews seemed to have reached the greatest degree of skill and power in the industrial arts. It is recorded in Exodus* that Bezaleel, the son of Uri, was "filled with the spirit of God in wisdom, and in understanding, and in knowledge, and in all manner of workmanship, to devise cunning works, to work in gold, and in silver, and in brass, and in cutting of stones to set them, and in carving of timber to work in all manner of workmanship." Moses taught the Israelites that "an excellent spirit" in working matter in forms of strength and beauty is divine, — indeed, a special gift from heaven; and in that early day, put the highest stamp of honor upon skilled labor. What forms of beauty and of joy vanished under the consuming touch of Tiberius, the modern world can only know from the record of history; but that they transcended in excellence those of any other nation is clear, so that in industrial art as in literature, the Jew is the teacher of the world.

* Chap. xxxi: 3-6.

It is plain that in those early days, the artists and artisans had the world of matter all to themselves. Scholars dealt with pure learning. But a day came when pure learning asserted her rightful supremacy. Roger Bacon, of the 13th century, forecast the philosophy of his greater namesake of the 16th, and stored light and heat like anthracite in his *Opus Majus*, for the service of generations five centuries distant. The *Novum Organum* and *De Augmentis* leveled the walls of *á priori* reasoning. Kepler and Laplace reached out to the stars, Newton laid the corner-stone of the physical sciences, and Lavoisier, Scheele, Priestly, and Davy, dropped their plummets into the depths of physical science, and found bottom.

With the rise of science, manipulation at once assumed great importance. No longer an end, it became a means to an end. From the drudgery of mere iteration, it passed into the exciting process of research and discovery. In future, the scholar in science must manipulate no less than the artist and the artisan.

But since the mere achievements of the intellect in the realm of pure thought must ever appear more attractive as objects of study to many minds, than her victories over matter, it was inevitable that there should be a division of the sciences into pure and applied. Manipulation is related to pure science as a servant, to applied science as a partner. Indeed, now that men are able to discover and apply the principles of all things, it becomes necessary that skill in handicraft should be joined in equal fellowship with knowledge, and the triumphs of skill directed by knowledge do not pale before the ancient achievements in the arts.

The Vienna acqueduct, forty-nine miles long, built in accordance with the laws of hydraulics, is as grand a

work as that of Appius Claudius, six miles long, built in ignorance of those laws, and will probably cost but little more. It is as noteworthy an achievement to build temples lighted and warmed, as to rear more massive walls through which no light could pass. There is more worth in a cylinder turned in a lathe in half an hour, than in the same form turned by hand in half a year. Undoubtedly, by applying science to the arts, men have accomplished much that would have been impossible to genius unaided by philosophy.

Again, it was natural that the study of the elements of pure science should fall into the hands of the university, while the study of applied science, demanding new resources and apparatus, should demand a new institution which has been called the polytechnic school. Advancing civilization tends to isolate the parts of training, and the increase of knowledge renders it impossible for any one to master it all. The rise of a new school in no way obscures or eclipses the old. It has never been clear that the cultivation of applied science is any part of the legitimate work of a college. The institution of such schools at Cambridge, New Haven, and Hanover, was in obedience to the mighty law of life which made those schools at that time a necessity, and unfolded them by an organic process. The place was ready for the school long before its appearance. It was in the natural order of things that the polytechnic school, nurtured through its infancy in the lap of the college, should soon attain its maturer strength and begin an independent career.

The place of the polytechnic school is to teach the application of the principles of science to the arts of production and construction, in order that the demand of the day for more intelligent labor and better-directed skill may be met, — in other words, to teach Technology.

The boy in the ancient artist's school must learn to produce forms of beauty, by imitation of his master, which would gratify the taste of some wealthy patron, and secure his patronage. The boy in the modern polytechnic school must himself become master of the principles of science, and apply those principles to rendering matter and force more and more subservient to the *welfare* of man, rather than to his passions or his tastes.

The training of the polytechnic is sometimes called the new education; but the Marquis of Worcester, in England, established a school of trades as early as 1670. The military schools of Germany began with the Reformation Wars. Frederick the Great found some schools in existence, and founded others. The distinguished school of Mézières was founded in 1749.

All this was a "shadow of good things to come," a foretokening of a broader and scientific system of technical training in all human industries. The great polytechnic schools of Europe began to be felt as forces in society early in the present century. The word technology was introduced by Dr. Jacob Bigelow, at Cambridge, in 1829, and is first found in his book entitled *Elements of Technology*. But it is true that in this country, the common school, the academy, and the college, monopolized control of education as late as the year 1850.

This sketch of its history shows that the polytechnic school has filled a place opened for it in the nature of things. It is interesting to note how it has asserted itself as an independent member of the family of schools in spite of the efforts to absorb it in the college. Take, for instance, the Lawrence Scientific School. President Hoar as early as 1672 wrote to Boyle, "A large, well-se-

lected garden and orchard for planting; *an Ergastulum for mechanic fancies*, and a laboratory chemical for those philosophers that, by themselves, would culture their understandings, are in our design for the students to spend their times of recreation in." In 1727 the professorship of Mathematics and Natural Philosophy was instituted; in 1783, that of Chemistry, with the first laboratory; in 1805, that of Natural History, by subscription of "a few citizens of Boston"; in 1816, the Rumford Professorship of Science, as applied to the arts, was endowed by bequest of Benjamin Thompson, of Woburn,—better known as Count Rumford,—"in order to teach by regular courses of academic and public lectures, accompanied with proper experiment, the utility of the physical and mathematical sciences for the improvement of the useful arts, and the extension of the industry, prosperity, happiness, and well-being of society." In 1839 the Astronomical Observatory was established, and in 1820, the department of Geology and Mineralogy. By a process of segmentation, the establishment of the Lawrence Scientific School followed in 1846, a distinct individual, though attached to the university.

Technology throve in its infancy here and elsewhere, under the guardianship of the college; but the same distinct recognition of its individuality which led such wise men as Abbot Lawrence of Boston, Joseph E. Sheffield of New Haven, and Abiel Chandler of Walpole, N. H., to endow separate departments of Technology at Harvard, Yale, and Dartmouth, unfolded into a bolder and more logical scheme in 1861 to incorporate the Massachusetts Institute of Technology, — a scheme approved and espoused by scores of scholars, and greeted, as no other had ever been, with the ap-

plause of mechanics and artisans. Technology in this institution came to her majority.

The passage of the act of Congress in 1862, to establish schools of agriculture and the mechanic arts, was specially significant, when the fact is considered that this period was perhaps the bitterest moment of the civil war. The act was an affecting recognition by Congress of the indispensable need of ample education in all free States, as an armory in war and a store-house in peace. This act was fruitful in beneficent results.

In 1868 the Worcester Free Institute of Industrial Science was opened (simultaneously with the interesting Russian Technical School at Moscow), where handicraft is for the first time, in this country, successfully incorporated in a course of technical training, and whose endowment is largely the free gift of the men directly interested in its success.

It seems clear from this account of the rise of the polytechnic school in this country, that it is rooted in the nature of things, and has its origin, not in the dreams of visionaries, but in the acknowledged need of modern civilization.

The methods by which the polytechnic school attempts to fill its place, demand attention.

The arts of production and construction which the polytechnic cultivates are grouped under the general term of *engineering*, — a term which really has a far broader and more comprehensive meaning than is usually assigned to it. Whoever understands the application of the science of mechanics to the multitudinous forms of mechanism, or of the science of chemistry to manufactures or agriculture, or of the science of mathematics to mapping mensuration, or geodesy, gunnery, etc., or in short, the application of any science to any

industry, is an *engineer*. The different kinds of engineering have a common origin, as different salts from one base under treatment by different acids.

Success in the best sense, as an independent engineer, demands a certain quality of good judgment, which is given partly by experience and partly by nature, but which cannot be given at all by a school. The school must content itself with preparing men, in the best possible way, to enter upon the duties of actual practice. The celebrated remark of M. Duruy concerning the boys of Le Creuzot, who had been nine years in training, is of universal application: "These lads," said the great education minister, "are now the best possible raw material for skilled workmen."

The day has past when the polytechnic school is looked upon as a resort for college weaklings, or as an easy road to knowledge; but it still suffers from two popular fallacies. The school-man and the business-man failing to discern the place of the polytechnic school, hastily conclude that it has no place except by usurpation. The school-man urges that the student would be much better off in some good college; the business man, observing in polytechnic graduates a certain lack of that fine quality of good judgment which comes only from experience, and is absolutely indispensable to high success, infers a fatal lack in the school. That these fallacies are sometimes maintained through the indiscretion of some polytechnikers, is not to be denied, but that they are fallacies the general history of technical education abundantly proves.

The polytechnic school undertakes to supply for young men, of sixteen to twenty, all the "conditions privative" of successful engineering. To its graduate it guarantees (on the presumption of diligence and in-

tegrity), an equipment adequate to an independent life in some position for which his training has fitted him. Whereabouts in the ascending scale of engineering practice that position shall be, and how high he shall rise from it, or how low he shall sink from it, depend wholly upon the "stuff and fibre" of the man.

The "personal equation" is more important in engineering than in almost any other business. If a boy is calculated for a superintendent, the school puts it in his power to be one by the shortest, easiest, and most useful process. But the school does not agree to make him superintendent, if his Maker has not done it. On the other hand, if a youth is calculated for a foreman or for a skilled workman, the polytechnic school undertakes to make him a more skillful, more useful, and happier man than he could possibly be in any one of those positions without the training. In short, by just so much as an educated man is better than an uneducated man in any position, the polytechnic school is serviceable.

There is another important limitation of the scope of the polytechnic school. It is not an *art school.* The study of form and proportion enters into its scheme of instruction, but that assiduous and loving study of art with reference to what are known as the fine arts and to the arts of decoration, is the proper work of the school of design. Such a school may thrive under the care of the polytechnic, for the same reason that the polytechnic itself once prospered under the wing of the college, but its isolation is on the whole natural and, "in the long run" inevitable.

The education of the engineer,—the legitimate work of the polytechnic school,—consists of three elements: manipulation or practice, technical training or theory,

and culture. Concerning manipulation, there is little doubt in the minds of those who have given most attention to the subject, that it is indispensable to the successful training of engineers. The best account of the usefulness of manipulation ever given, is in Professor March's commencement address at the Worcester Free Institute, from which I shall venture to quote at length:

"The school-boy who repeats a passage from Webster or Bacon, does not necessarily repeat in his own mind the thought of Webster or Bacon. One of Bacon's essays has been read by a school-boy as a composition of his own. The lad did not see anything in it which he could not have written himself. Manipulation is the natural means of arresting this sublimation of the mind. It should be further remarked of the nature of language, that it lags far behind the progress of thought. The innumerable judgments on which sagacity depends, are comparatively few of them expressed in the formal speech of artificial signs. The old furnaceman tells from the look of the bubbles when the charge of steel is becoming ready; but he has no name for that look. The engineer puts down brakes at a peculiar noise in the engine, as instinctively as the eyelids close when a fly approaches; but he has no name for the noise. A thousand nameless, wordless judgments of relations between objects and acts are all the time going on in the mind of the sagacious man. All processes of reasoning need signs, but original thinking and practical sagacity demand the use of primary signs, in place of the secondary signs of language. Manipulation is necessary to make up the shortcomings of speech.

"Its most general use is to keep the mind awake and alert. Lectures are apt to go in one ear and out at the

other. The printed page passes before the eye like a shadow. We set ourselves to think, but we brood. To study without pen in hand, is to dream. In manipulation, thought passes into act. We use our hands and eyes, we are kept busy adjusting and controlling material objects.

"The manipulator stores his mind with conceptions of the senses, with information from the eyes, ears, nose, the finger-tips, the muscles, and the meters of science, those magnified senses; without these firm roots, men are poor sapless things.

"Manipulation trains the organs of perception: the eye of Herschel, the thumb of Phidias. Chemistry, botany, mechanics afford the most effectual gymnastic of manipulation. Sir Garette is a goodly figure in the *Morte d'Arthure*, in that he has 'the fairest and the largest hand that ever man saw,' and some one has characterized the Anglo-Saxons as the race with more nerves in their hands than there are in the heads of any other race.

"It gives clear and distinct ideas. The complex ideas of modern science, to which the technical terms must guide us, are the result, for the most part, of wide generalization. They are obscure and indefinite to every man until he has often applied them to real objects.

"This process of minute attention and verification strengthens the memory. Once worked-out is faster in mind than ten-times learned. The affections of the senses redouble the inner memory. The recurrent force of muscular and nervous habits is added. A long verbal description often, in fact, belongs to a movement that is comprehended in a single stroke of the eye, or other brief experience, which the memory holds without effort.

"But a greater advantage of manipulation is that it trains the judgment. The reduction of theory to practice cannot be an exercise of mere memory.

"And finally, the manipulator is in training to become an inventor and discoverer." *

The practical judgments of responsible men confirm that of the scholar so completely, that it is about to be impossible for a young engineer, destitute of practice, to secure employment different from that which would be given to a novice.

With this important auxiliary at command, the polytechnic school undertakes to train the mind for a special service,—for the end is to secure disciplined faculties of thought behind the cunning fingers. It is for this end mainly that all manipulation is serviceable. Hence the reasoning power must be strengthened by exercise in the mathematics; the habit of acute perception and accurate induction is required by study of the physical sciences; the imagination and taste are cultivated by many methods; the faculty of expression through practice in the living languages; and, at length, the student is made familiar with the laws of matter and of force, and the methods of working under those laws for the material prosperity of mankind.

The third element in technological training is *culture.* The importance of a broad and generous culture in technical training, is urged most strenuously by practical men. I attended a large and important joint meeting of the Institute of Mining Engineers and the Society of Civil Engineers, at the Hall of the Franklin Institute,† on the 19th of June, held expressly to dis-

* Worcester *Daily Spy*, July 13, 1876.

† See Discussions on Technical Education: published by American Institute of Mining Engineers.

cuss technical education. A great number of the most eminent mining and civil engineers spoke, and their voices were all for more culture. The opinion prevailed that technical training is just so much more serviceable as it is blended with the graces and ornaments of culture. The grounds on which these opinions were based it is not necessary here to state, because they are the solid convictions of the most influential body of engineers in this country. Many of the leading German polytechnikers are seriously arguing the abolition of the Real Schule, as an independent school, and requiring all students to pass through the gymnasium on their way to the Polytechnic. It is well to state these points concerning culture clearly and emphatically, because it has been somewhat loosely supposed that a technical school is a refuge for college weaklings, a necessary evil rather than a necessary good. I know a valuable Greek professor, who thinks it may be very well for a boy who cannot afford to go to college to join a technical school, but he must not call it education. Alas! he has forgotten one thing of the isles of Greece, that "though the sun of summer gilds them yet, all except their sun has set."

Others, again, concede a certain importance to the work of the technical school, from the fact that it gives a certain spur and stimulus to all education. They hold it to be a kind of eccentric on the axle of the revolving year, which annually gives the college a lift. These and many other fancies make it doubly necessary to insist upon the utmost culture in technical students. For what are they to do? They are to follow Newton, and Helmholtz, and Faraday in discovering the laws of nature; and Fulton, Watts, Henry, and Stephenson, in applying those laws to the promotion of the comfort

and prosperity of their fellow-men. This work ought to be done with a clear and accurate knowledge of what others have done, with the mastery of a good style of expression, with a reverent spirit and unspotted integrity. To these must be joined that catholicity of temper which enables a cultivated man to appreciate, and to appropriate to noble uses, any and every form of knowledge.

The polytechnic school, then, must secure three things, culture, technical instruction, and skill in handicraft. Either of these elements might occupy the whole time assigned to the school. It must, therefore, presuppose something and expect something. In order to the best possible results, it must presuppose as thorough a training as the college requires for admission, and must expect of every graduate that every year of his post-graduate, active life will add something to the efficiency of his powers. It has to expect, particularly in the graduates, a large acquaintance with the literature of their respective departments, and a growing interest in all forms of knowledge.

An important question arises at this point. How shall these elements be combined? Some would put manipulation first, followed by culture and technical training. This is Mr. A. L. Holley's view. Others would put handicraft last, preceded by technical training and culture. This is the view of Mr. Coleman, Sellers, and others, who believe in a college training in all cases. Others would put handicraft between the others. Now to all these sandwiching methods there are serious objections.

First, the mere teaching of manipulation, apart from other instruction, is far less efficient than when mingled with it. The reasons are obvious.

Secondly, it is not true that the only method of acquiring culture is by way of the college. The main point in culture is to inspire and awaken a desire and love for all knowledge, and a loving, reverent spirit.

Third, the period of sharpest acquisition lies between the ages of sixteen and twenty-two. This is a general limit. Youth cannot enter the military academy at West Point, nor those at Berlin or Paris, older than twenty-three. Experience seems to have settled the point, that those parts of education which enter during this period really give tone and shape and direction to life. Now if handicraft be crowded out, at either end of the technological course, it must suffer in comparison with either of its associated elements. What has been urged on the ground of training in manipulation goes to demonstrate the importance of mixing it with the other parts of technical training.

To discriminate between teaching arts and trades, is open to the suspicion of an attempt to evade the inexorable laws of labor. It is the undoubting opinion of many who have watched the operation of one experiment in this country, that the connection of academic culture and the practical application of science is advantageous to both, in a school where these objects are started together, and carried on with harmony and equal prominence. The academy inspires its intelligence into the work of the shop, and the shop, with eyes open to the improvements of productive industries, prevents the monastic dreams and shortness of vision, that sometimes paralyze the profound learning of a college.

It is idle to expect any considerable number of students to take up technics or handicraft after a college

course. The son of a strong and successful iron-master may be drawn into the paternal shops, after his college course, for many obvious reasons. The director of a Bessemer Plant can hold his son true to his own business. A successful manufacturer may persuade his son that what the world really needs is men who bring to business the elegant culture of the college. But these are the exceptions. The college has, always had a special mission; viz., for pure intellectual gymnastics, and its leading has been toward the professions.

The college undertakes to prepare men for all kinds of active life by laying "broad foundations," in the fallow ground of philology, literature, pure science and art. It is especially averse to any concentration of effort upon a particular point. For this work it is erected and greatly needed. All concessions of the college, by electives parallel courses, etc., to the so-called "spirit of the age," are injurious to the college and not helpful to technology. The general issue of the scientific courses in the college is to throw the glamour of the college around an imperfect and ragged study of science. At least, this is true of applied science. The study of pure science, especially with reference to original investigation, may be pursued to great advantage in the college,—in fact, ought to be pursued there; but the study of science in the technological sense, can be more effectively done in a technological school. One who has tasted of oranges in Havana, finds small satisfaction in the conservatory product.

Further, it is safe to say, that not more than five per cent. of the students in polytechnic schools in this country would ever have gone to college. Their education would have ceased with the elements. This

school strikes its roots into new soil,—into deep-buried strata.

Again, the whole drift of things is toward isolation of parts, rather than an assemblage. Segmentation is the law of life. It would be a great forward, onward, inspiring movement to restore the college to its ancient simplicity, with a judicious election of courses, but none of studies. The average man would then, at least, have some ground for a judgment, as to what the product of a college really is, and the graduate of the college would be a constant, rather than one of an indefinite number of variables.

Again, there is not time for a college course and one in technics. Young men feel bound to begin actual life before the age of twenty-five, and that does not admit of two separate courses of advanced study. Considering all these facts and difficulties, and many others which might be mentioned, I am forced to the conclusion that the only safe and practicable plan for a school of technology is to demand for admission the same preparation as for college, and to blend technical instruction and handicraft. The polytechnic school will thus stand side by side with the college, its only true position; strengthen all the secondary schools, and give new scope and power to their work; avail itself to the utmost of the maximum of the acquisitive power before the age of twenty-one, and graduate young men who have practical power and theoretical knowledge, hand-in-hand, and so ready to begin life in engineering with assured promise of success. Young men who graduate under such training are the ones most in harmony with the age and surest of success. There are many pursuing mere handicraft who ought to be in a polytechnic school, and many in a polytechnic school who ought to

be pursuing handicraft. A polytechnic school is bound, even more than a college, to exercise the most careful supervision of its students, and the utmost conscientiousness in conferring its diplomas. No such institution will ever confer any degree, except such an one as indicates average knowledge of its own courses. Degrees of mechanical engineer, civil engineer, and the like, can only be justly conferred on those who have earned them by some years of actual and successful professional service.

It will, undoubtedly, be objected to this view of the plan of the polytechnic school, that it only provides for educated workmen. This is true. I am clear in the belief that the engineers of the future must and will be educated workmen. All engineers who enter the calling from any other side will be more and more compelled to seek a remedy for their error by the acquisition tion of practical knowledge, or in some other employment.

What advantage has the educated engineer over the uneducated? Take the mechanic as an illustration. The educated mechanic desiring to make a new machine, to accomplish a certain end, forms a plan of it in his mind, projects that plan on paper, calculates the kind and strength of material to be used in each part, and then constructs it with as much certainty as to its working as is possible in any human affair. The uneducated mechanic, desiring to accomplish the same end, makes a rude model of a machine by shaping and fitting its parts, changing them without any assigned reason or certainty of improvement, and succeeds, if he succeeds at all, at an expenditure of time, labor, and material, many fold greater than the other's. In short, one is an engineer, the other an artisan; one works economically, the other wastefully.

An obvious inference from this history of technology is, that it appears as an outgrowth of an advanced civilization and established institutions. In a newly settled country communications must be established, however rough the roads and bridges, or at whatever cost; mines must be opened and ores smelted, however rich in metal the slag may be; the soil must be tilled at whatever disadvantage; but the inevitable logic of events is, that mind everywhere, sooner or later, asserts her dominion over industries as well as over matter, and attention is more and more paid to the method and means of production and construction, as well as to the results. Communications must now be established by the most available paths, in the use of the most serviceable materials, applied in the most economical manner. Metals must not be allowed to escape the smelter in the slag; the soil must not be impoverished by tillage, but, on the contrary, enriched. To meet this demand, men must be assiduously trained.

If this technology has a place anywhere, it is certainly in America. Here are a people entering upon the higher plains of civilization, having passed the epoch of thoughtless and aimless expenditure, with unlimited opportunity for growth and resources equal to any emergency; a people with a growing confidence in learning, and deepening appreciation of its value; a people who also honor labor, and with a certain ecstacy of enthusiasm applaud the unaided achievements of labor; a people, therefore, ready for the bridal of learning and labor. For this engineering of the future, American youth must be prepared in American schools. The necessity for the aid of French military engineers, so urgent in the Revolution, has been completely obviated by the graduates of West Point, and the demands of engineer-

ing, in all other forms, will soon be as completely satisfied by the graduates of our polytechnic schools.

On the plane of the college, in the form of the professional school, resting upon the high school and academy, grasping by the one hand learning, and by the other labor—this is the place of the polytechnic school in American education.

LECTURE VII.

English Literature in the Common School.

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The term "literature," in its widest application, includes all that has been written and thus preserved. Literature, in a more specific sense, excludes purely scientific and other writings that are addressed to the intellect alone. Literature presents not only the true, but the beautiful and the good.

Our subject suggests four important questions, which cannot indeed be answered in the time allotted, but to which I may make reply.

The first question is, "Why study literature in our common schools?"

This question may be put with impatient scorn by those who think that the only proper work of a common school is to train pupils to read, to write, and to cipher. This question may be a mere figure of speech, implying a negative, when uttered by those who look upon the intellectual culture of the masses as an expensive luxury, and dangerous to the selfish plans of a would-be aristocracy. But, so long as we are a nation of freedmen, it will be economy to develop in our public schools genuine manhood rather than to make parts of a social

mechanism. This question is to most of us a very suggestive question, and it will not surprise me if reasons for the study of literature should present themselves to some of your minds in greater force and number than those which I now present.

The study of English literature is an important means of developing one's power of expressing his own ideas and thoughts. The art of speech is an imitative art, and the appropriate use of language in written composition is for the most part the result of unconscious imitation. One's style is formed, not by the study of the rules of grammar or of rhetoric, but by the appreciative reading and study of literature. Rhetoric and grammar may prune, but they never produce our formulæ of expression. Where thought flows unhindered into speech, or writing, it unconsciously appropriates words previously gained through the eye or the ear.

Again, literature is important in its relations to history. The importance of a knowledge of history,—the past in which the future mirrors itself,—is acknowledged by all. To no people is this knowledge more important than to the citizens of the United States. History, in our schools, is valuable in proportion as it is a source of useful knowledge and of noble impulse, and the knowledge without the impulse is well nigh valueless. Example, as presented in the lives of great and good men, is a source of noble impulse, and there is no biography so truthful as that which appears in their own writings. A knowledge of the literature of a period is indispensable to its history. The spirit and the purpose of the men of the Revolution, or of any other period of the nation's history, cannot be known from a dry, detailed account of what was done in councils of State or on the battle-field. We must know how these men felt, if

we would feel the force and fire of their patriotism. To receive their personal impress we must study their own utterances, keeping in mind the circumstances in which those utterances were made. As you study the utterances of John Adams, of Otis, of Hamilton, and of other illustrious patriots of the time, you feel the warmth of enthusiastic purpose that thrilled a whole people. The youngest boy who reads, feels something of the force of that patriotism that laid the foundations of our republic. There is no better way to learn history than by an acquaintance with those persons, who who were at once the embodiment and the representatives of the spirit of the times in which they lived. This acquaintance is gained by studying their autotypes as they appear in their own writings.

I doubt if we shall find a truer picture of the loyalty of purpose and moral courage of the nobler Puritans of the 17th century, of which Milton was the peerless type, than in his description of the seraph Abdiel:

> "So spake the seraph, Abdiel, faithful found
> Among the faithless, faithful only he;
> Among innumerable false, unmoved,
> Unshaken, unseduced, unterrified,
> His loyalty he kept, his love, his zeal;
> Nor number nor example with him wrought
> To swerve from truth, or change his constant mind,
> Though single. From amidst them forth he passed,
> Long way through hostile scorn, which he sustained
> Superior, nor of violence feared aught;
> And with retorted scorn, his back he turned
> On those proud towers to swift destruction doomed."

It has been said, and with truth, that it is of far less importance what means of culture are employed in schools, than how those means are employed. The special advocates of the study of natural science are

not slow to urge that the natural sciences are a successful means of culture, and are also of immediate practical value. It is often forgotten that a reliable judgment, an indispensable requisite for valuable research and for the useful application of scientific truth, is not developed by exclusive study of any one kind of truth. It is often forgotten that the moral faculties need culture, so that the executive, the practical faculties, may not be used for unwise or bad ends.

Again, the naturalist needs language to express gracefully the facts he may discover or the principles he may evolve. To reach the first position, as a naturalist, he needs the facile pen of a Tyndall as well as his trained power of patient observation. The language of Hugh Miller, in his printed works, shows that he studied Shenstone and Milton, as well as the rocks of Scotland. Dana was first eminent as a student of language and literature, and afterwards as a naturalist. If we are forced to compare the study of natural science and the study of literature, this clearly may be said in favor of the study of literature; the means of this study are available at all places and in every season. The artificial apparatus and the natural specimens required to pursue the study of natural science, systematically and successfully, to any considerable extent, are not easily within the reach of all. But no such hindrance lies in the way of the study of literature.

The special advocates of natural science sometimes speak as if natural objects were the only means by which the perceptive faculties of a child are developed; but to learn a stanza of poetry a pupil must employ his perceptive faculties. He is soon aware that a prime element of success is the accurate use of the sense of sight. The study of literature is an acknowledged

means of cultivating the memory, and we should not pass unnoticed the aid that imaginative literature renders to scientific investigation. Every grand deduction of science is preceded by vigorous action of the imagination. In a letter which I recently received from Barnas Sears, LL.D., formerly president of Brown University, he says: "Prof. Agassiz told me that when he went to Florida, to study the origin of the everglades, he took with him only one book, and that was Goethe's Faust. He wished to excite the imagination in the highest degree, that it might conceive of all possibilities. His science would confine it to the proper range. 'Discoveries,' said Agassiz, 'are made by a sort of inspiration seizing upon remote analogies and suddenly forming a picture of reality, by a single glimmer, just as the artist forms his ideal.'"

Tyndall acknowledges his indebtedness to his imagination in making his scientific discoveries. He also acknowledges his indebtedness to literature as a means of developing his imagination, and of keeping it on the alert in scientific investigation.

In one of his addresses to his pupils we find the following passages: "Though hardly authorized to express any opinion whatever upon the subject, I nevertheless hold the opinion that the proper study of a language is an intellectual discipline of the highest kind." . . . . . "The reading of the works of two men, neither of them imbued with the spirit of modern science, neither of them indeed friendly to that spirit, has placed me here to-day. These men are the English Carlyle and the American Emerson." Tyndall adds, that "but for these two men" he "would never have become a physical investigator."

The majority of the pupils in our schools may not be-

come inventors, or eminent discoverers of scientific truth, yet to understand what has been already discovered in astronomy, in geology, or in any other department of natural science, requires vigorous use of the imagination. One of the best ways to train the imagination to accomplish the tasks imposed, even in the studies of the common school, is to give it that exercise which the reading, the memorizing, and the study of excellent poetry are adapted to secure.

Nor does the study of literature, even the most imaginative, leave the reasoning faculties without exercise. Coleridge, in his Biographia Literaria, reveals the value of literary culture. He tells us how Bowyer, of Christ's Hospital, had his pupils "read Shakespeare and Milton as lessons," and adds, "I learned from him that poetry, even that of the loftiest, and seemingly that of the wildest odes, had a logic of its own as severe as that of science, and more difficult, because more subtile, more complex, and dependent on more and more fugitive causes. In the truly great poets, he would say, there is a reason assignable, not only for every word, but for the position of every word."

Bryant says, "There is in all true poetry a reference to reason in her higher moods and nobler offices, so that her jurisdiction is constantly acknowledged and her laws kept ever in sight."

Again, in a republic, if nowhere else, moral culture is one of the most important functions of a public school. Under any form of government, social order must be secured by the fear of physical force or by the self-control of its subjects. The foundation of our free civil institutions is the self-control of all the citizens of the republic, in accordance with recognized law. The governing faculties of the soul belong to the moral na-

ture. Self-control comes by developing the moral nature in accordance with principles of right. Literature has ever been, and will ever be, in the hands of an earnest teacher, an effective means of moral culture.

It is unnecessary for me to prove that in the employment it affords for leisure hours, in the recreation which it affords, in the constant aid it furnishes to a true home-life, in the delight it brings to the fireside,—

> "the fixed delights of house and home,
> Friendships that will not break and love that cannot roam;"

an appreciation of wholesome literature is one of the safeguards of morality, as well as an unfailing source of happiness. How many, as the weary hours of evening group the family about the fireside, take up the sentiment of Longfellow,—

> "Come, read to me some poem,
> Some simple and heartfelt lay,
> That shall soothe this restless feeling
> And banish the thoughts of the day.
>
> Such songs have power to quiet
> The restless pulse of care,
> And come like the benediction
> That follows after prayer."

It is unnecessary for me to show that the study of literature may be the study of art, by which a correct taste is developed and the love of the beautiful strengthened. English art, in a far greater degree than the modern art of Italy or of Greece, is embodied in a national literature. When the wave of that new intellectual life named the Rennaissance, sweeping over Southern and Western Europe, reached England, printing was already there, and the thought and the aspiration of the period found a ready expression in the literature of the Elizabethan age, rather than in statuary, paint-

ing, or architecture. You seek in vain upon the soil of England for a Parthenon, but you find a Shakespeare in her literature. England can boast but few cathedrals that attract the eye of the artist, but she has the sublime majesty of many cathedrals in her Paradise Lost. Art, embodied in literature, is less sensuous and is less impressive to the superficial thinker than painting or sculpture, but it is more pervasive, reaching in its influence the hut of the peasant as well as the palace of royalty, and ministering to a nation's weal as painting, sculpture, or architecture even, cannot minister. It was fortunate, nay, providential, that the Bible was emphatically the book during the formative period of English literature, furnishing loftier themes and purer ideals than ever stirred the soul or stimulated the hand of painter or sculptor in the age of Pericles

It is needless for me to prove that the appreciative study of excellent literature refines and quickens the moral faculties. Thus it ministers to character the highest and the best product of the family and the school.

If, as that eminent scholar, Sir William Jones, wrote upon the blank page in his Bible, "The Scriptures contain, independently of a divine origin, more important history and finer strains, both of poetry and eloquence, than could be collected within the same compass from all other books that were ever composed in any age or in any idiom," then the ability to appreciate the excellences of literature may lead, at least, to an appreciation of the marvelous setting of the divine truths of the Word of God.

The importance of the study of literature is recognized in the large place which Greek and Latin classics hold among liberal studies. The thorough study of

English literature has not yet obtained its proper place in our public schools.

It is not easy to estimate the value of the thought, feeling, and endeavor treasured for us in our mother-tongue. He who acquaints himself with the best literature of a people takes hold of the imperishable thought of that people, and introduces himself to their best life. The uncertain extent of empire, the splendor of royalty, the movements of armies, and the brilliant succession of little great men, that pass in review as one considers the events of history, all seem dim and insignificant when compared with the steady light which a single great author throws upon the retreating and shadowy past, while he illumes the future even, with prophetic glow.

Chaucer is worth more to us than all the annals of his sovereigns. If Spenser's sweet music had not reached us, if Bacon had not appeared as a teacher of his own and of all subsequent times, if Shakespeare had not given us his almost superhuman revelation of human nature, if Milton had not swept from his lyre strains that can never die, the Elizabethan period, with all its marked political events, would be of secondary importance. Literature, robing the material world with its associations, imparts to it even, something of the beauty and the excellence of our spiritual nature. A more than earthly light rests upon the hills and vales of Attica. The dun heather and the scattered lakes of Scotland take on new beauty from the romance and song of Scott. There never was a plainer or more philosophic truth than that uttered by the poor Scotch carpenter, who said that "it seemed to him that the country had grown more beautiful since Burns had written his bonnie little songs about it." What would the hills of

Judea be to us if stripped of the associations of sacred literature? Even the place where one has read, and has felt the deep impulse of a truly great and good writer, is ever after no common place. The most meagre abode, whose fireside has been hallowed by communion with the mighty dead, is no vulgar resting-place for memory.

Archdeacon Hare says, "A man should love and venerate his native language as the first of his benefactors; as the awakener and stirrer of all his thoughts; the frame and mould and rule of his spiritual being; as the great bond and medium of intercourse with his fellows; as the mirror in which he sees his own nature, and without which he could not even commune with himself; as the image in which the wisdom of God has chosen to reveal itself to him."